Vol. 903 Number 4

OFFICIAL GAZETTE

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UNITED STATES PATENT OFFICE

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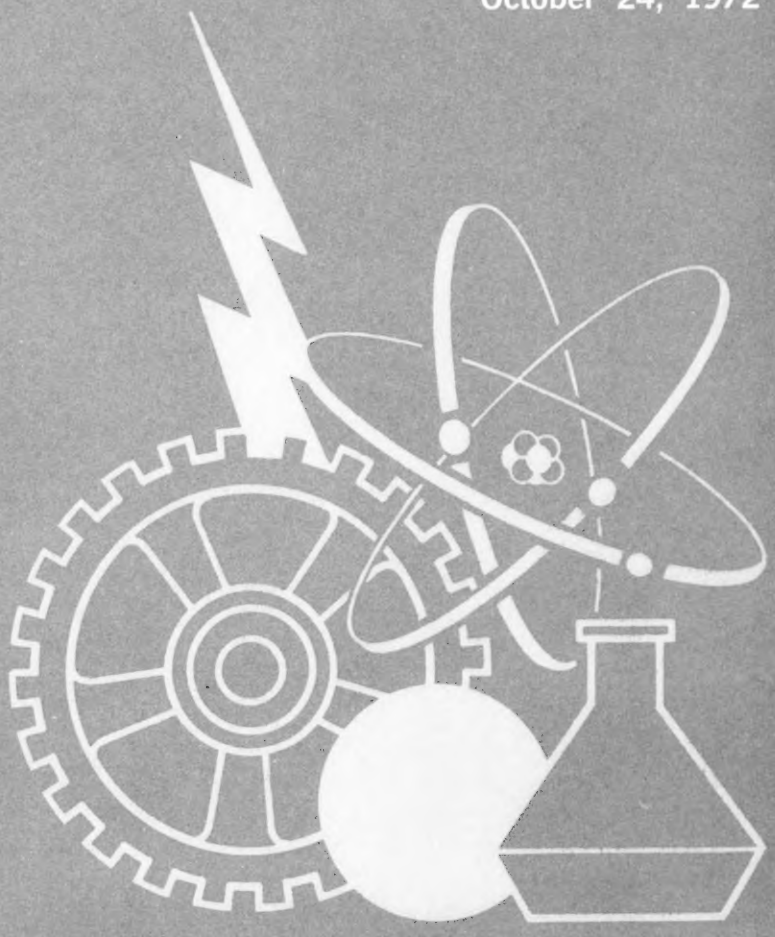
A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

October 24, 1972



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

October 24, 1972 Volume 903 Number 4

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PATENT OFFICE NOTICES

Certificates of Correction for the Week of Oct. 24, 1972

Re. 27,381	3,617,613	3,647,950	3,665,293
D. 222,852	3,617,615	3,648,002	3,666,694
3,449,116	3,618,875	3,648,415	3,666,887
3,550,749	3,620,715	3,649,325	3,666,978
3,558,773	3,620,831	3,649,712	3,667,539
3,569,968	3,622,048	3,649,750	3,667,561
3,574,955	3,622,265	3,649,864	3,667,649
3,576,424	3,622,475	3,650,184	3,667,947
3,578,076	3,622,809	3,650,920	3,667,976
3,580,402	3,622,817	3,651,614	3,668,158
3,583,709	3,623,754	3,651,682	3,669,107
3,584,353	3,624,643	3,652,314	3,669,455
3,593,211	3,624,787	3,652,588	3,669,722
3,596,745	3,624,862	3,652,658	3,669,742
3,599,439	3,625,725	3,652,928	3,670,455
3,599,832	3,626,073	3,653,911	3,670,883
3,599,835	3,627,221	3,654,613	3,670,920
3,600,463	3,627,256	3,655,686	3,671,297
3,601,534	3,627,775	3,655,804	3,671,312
3,603,624	3,628,201	3,655,845	3,671,342
3,604,819	3,631,241	3,656,485	3,672,252
3,605,624	3,631,411	3,657,252	3,672,423
3,606,497	3,631,625	3,657,398	3,672,613
3,606,827	3,632,228	3,658,266	3,672,661
3,607,055	3,633,798	3,658,454	3,673,141
3,608,038	3,634,883	3,658,629	3,673,246
3,608,484	3,635,091	3,660,404	3,673,727
3,608,958	3,635,523	3,660,470	3,674,471
3,609,012	3,636,867	3,661,143	3,675,097
3,609,098	3,637,449	3,661,428	3,675,745
3,609,298	3,639,213	3,661,756	3,676,532
3,610,169	3,639,795	3,661,820	3,676,719
3,612,256	3,640,084	3,662,553	3,677,015
3,612,261	3,642,421	3,663,202	3,677,077
3,612,302	3,645,113	3,663,351	3,677,663
3,612,840	3,645,567	3,663,358	3,677,738
3,613,834	3,645,851	3,663,439	3,678,027
3,614,193	3,646,218	3,663,732	3,678,199
3,615,806	3,647,092	3,663,744	3,678,466
3,616,316	3,647,137	3,663,776	3,680,044
3,617,254	3,647,507	3,664,227	
3,617,471	3,647,927	3,664,876	

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF OCTOBER 3, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-11-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	6-01-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-09-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-08-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—Director (Vacant). Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-04-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	2-09-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-06-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-01-71
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—Director (Vacant). Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-11-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	10-18-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts: Household, Personal and Fine Arts.	3-17-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-01-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus: Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	7-21-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	9-23-71
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	10-27-71
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-19-71

Expiration of patents: The patents within the range of numbers indicated below expire during October 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,719,294 to 2,721,998, inclusive
Plant Patents..... Numbers 1,423 to 1,426, inclusive

REISSUES

OCTOBER 24, 1972

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

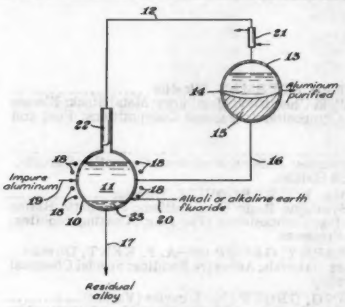
27,509
SEPARATION OF ALUMINUM FROM IMPURE ALUMINUM SOURCES

Gilbert S. Layne and James O. Huml, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Original No. 3,397,056, dated Aug. 13, 1968, Ser. No. 507,974, Nov. 15, 1965. Application for reissue Mar. 6, 1970, Ser. No. 17,360

Int. Cl. C22b *21/06*; C01f *5/28, 7/50*

U.S. Cl. 75—68 11 Claims



A process for the purification of impure aluminum wherein a mixture of impure aluminum such as aluminum scrap and/or alloys and a molten metal fluoride are heated in a reaction zone under a pressure above about 100 mm. of mercury absolute to a temperature above the melting point of the mixture. The vaporized products are condensed into a quiescent zone and the purified aluminum is separated from the two phase system which develops.

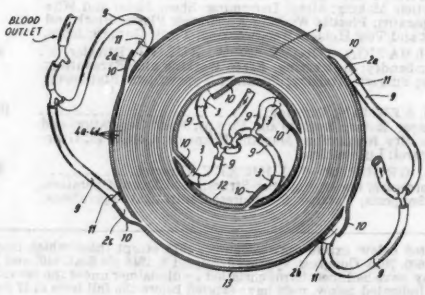
27,510
ARTIFICIAL KIDNEY

Josef Hoeltzenbein, Muenster, Germany, assignor to Baxter Lab. Inc., Morton Grove, Ill.

Original No. 3,510,004, dated May 5, 1970, Ser. No. 720,812, Apr. 12, 1968, which is a continuation of Ser. No. 582,896, Sept. 29, 1966. Application for reissue Nov. 1, 1971, Ser. No. 194,278

Int. Cl. B01d *31/00*

U.S. Cl. 210—321 24 Claims



A dialysis tube for blood is coiled to form membraneous layers supported by a member having first and second strands arranged at angles from and projecting their length away from each other for forming flow channels for blood and dialyzing fluid.

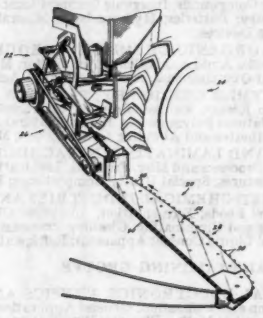
27,511
IMPACT MOWING APPARATUS AND SYSTEM

Norman Carl Locati, Lake Oswego, Oreg., assignor to Omark Industries Inc., Portland, Oreg.

Original No. 3,545,188, dated Dec. 8, 1970, Ser. No. 759,831, Sept. 16, 1968. Application for reissue Feb. 17, 1971, Ser. No. 116,179

Int. Cl. A01d *55/24*

U.S. Cl. 56—245 7 Claims



An apparatus and system for mowing vegetation and the like including a cutter bar adapted to mount a driven flexible belt having attached thereto a plurality of cutter elements. Said apparatus and system including means to automatically sharpen the cutter elements with said cutter bar supporting the cutter belt in a horizontally disposed and forwardly projected convex curve. The cutter bar has retaining rails for retaining the cutter belt on the cutter bar during the mowing operation and further includes sheaves that support the cutter belt in a manner whereby clogging is avoided. An accumulator tightening mechanism maintains the belt under a constantly desired tension. Said apparatus and system further includes means whereby the cutter elements are protected from hard objects lying in the path of the mower.

27,512
ATHLETIC SHOES

Kihachiro Onitsuka, 91–5, 1-chome, Kitano-cho, Ikuta-ku, Kobe, Japan

Original No. 3,535,799, dated Oct. 27, 1970, Ser. No. 820,528, Apr. 30, 1969. Application for reissue Dec. 10, 1971, Ser. No. 206,955

Int. Cl. A43b *00/00*

U.S. Cl. 36—2.5 P 4 Claims

A reinforced athletic shoe includes an upper member of woven fabric material, a first reinforcing member joined with the lower peripheral portion of the upper member, and toe and heel reinforcing members joined with the first reinforcing member and upper member. The upper member and the reinforcing members are

stitched to a sole which includes upper and lower cloth members made of woven fabric material joined by cement

and a bottom member formed of wear-resistent synthetic rubber.

27,513

APPARATUS TO PRINT AN EMBOSSED PATTERN ALONG THE PERIPHERAL BAND OF A TOROIDAL ARTICLE

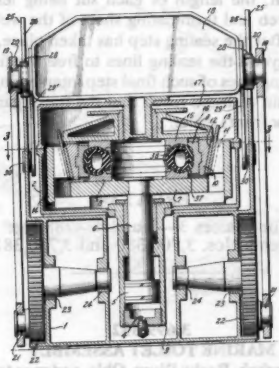
Antonio Pacciarini and Dario Giletta, Milan, Italy, assignors to Industrie Pirelli S.p.A.

Original No. 3,337,918, dated Aug. 29, 1967, Ser. No. 438,825, Mar. 3, 1965. Application for reissue Mar. 23, 1971, Ser. No. 127,417

Claims priority, application Italy, July 7, 1961, 12,473/61, Patent 658,679; Feb. 10, 1962, 2,639/62, Patent 665,377; Aug. 4, 1964, 17,022/64

Int. Cl. B29h *5/02*

U.S. Cl. 425—39 **20 Claims**



Apparatus for imprinting a predetermined embossed pattern upon the peripheral band of a toroidal article while the band is in a plastic state, including a mold having two coaxial continuous annular sections and a third section disposed between the annular sections. The third section includes a plurality of sectors, each of which has on its inner surface a plurality of radial projections adapted to engage the peripheral band. Means are also provided to axially displace the annular sections relative to each other along with means to displace the sectors in a radially inward direction towards the article after it has been enclosed between the annular sections.

27,514

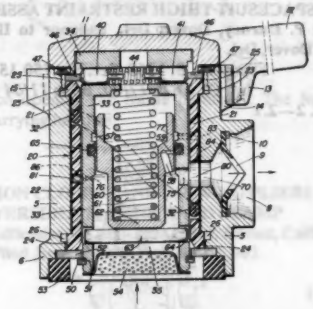
RETAINER VALVE

Henry R. Billeter, Deerfield, Ill., assignor to Sloan Valve Company, Chicago, Ill.

Original No. 3,526,248, dated Sept. 1, 1970, Ser. No. 693,801, Dec. 27, 1967. Application for reissue Mar. 22, 1971, Ser. No. 126,624

Int. Cl. F16k *11/00*; B60t *15/54*

U.S. Cl. 137—599.2 **18 Claims**



This retainer valve has a sleeve valve rotated by a handle to three different positions. A tubular bushing around the sleeve valve has three air ports, each of different capacity, which are adapted to communicate with air ports in the sleeve valve and these with an exhaust opening in the valve body. A piston in the sleeve valve controls one of the air ports. An oblique O-ring seal in the tubular bushing seals the different ports from the exhaust passage in the different handle positions. In one position full air exhaust is provided from the air brake pipe. In the second position 20 p.s.i. is retained by the piston control; while in the third position a slow restricted exhaust is provided.

27,515

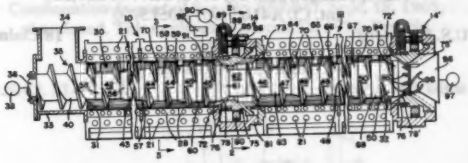
MECHANICAL SCREW PRESS

Dean K. Bredeson, % The French Oil Mill Machinery Company, P.O. Box 920, Piqua, Ohio 45356

Original No. 3,518,936, dated July 7, 1970, Ser. No. 758,300, Sept. 9, 1968. Application for reissue May 19 1971, Ser. No. 144,839

Int. Cl. B30b *9/12, 15/00*

U.S. Cl. 100—117 **10 Claims**



A screw press has a cage with spaced screen bars defining drainage slots therebetween. A rotatable screw extends through the cage and includes a shaft supporting a plurality of worms with axially spaced helical flights, and breaker bars are mounted on the cage projecting between the flights to resist rotation of the material with the screw. An annular choke member is connected to the cage intermediate the inlet and discharge ends and has a tapered inner surface which cooperates with a collar mounted on the shaft between a set of adjacent flights to define an intermediate restrictive orifice. The choke member is adjustable exially or interchangeable with other choke members for varying the size of the orifice to obtain the optimum progressive expression of liquid from the material.

PATENTS

GRANTED OCTOBER 24, 1972

GENERAL AND MECHANICAL

3,699,589

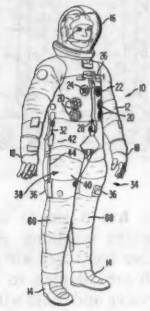
SPACESUIT THIGH RESTRAINT ASSEMBLY

George P. Durney, Dover, Del., assignor to ILC Industries, Inc., Dover, Del.

Filed Aug. 5, 1968, Ser. No. 750,159

Int. Cl. A62b *17/00*; B63c *11/04*

U.S. Cl. 2—2.1 **13 Claims**



A thigh restraint assembly for a pressurized spacesuit which provides improved mobility for the wearer in the area of the thigh an crotch. It comprises thigh convolutes restrained by fabric covers and vertical thigh cables and reinforcement in combination with a plurality of crotch cables and cords passing through the crotch between the front and rear of the suit. The assembly cooperates with the torso and upper legs of the suit to maintain suit stability and to provide stress relief in the area of the joints. It cooperates with a torso block and tackle assembly to provide 90° of forward bending movement.

3,699,590

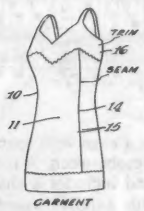
ANTISTATIC GARMENT

Harold H. Webber, Groton, and Pauline F. Riordan, Lowell, both of Mass., assignors to Brunswick Corporation

Continuation of Ser. No. 4,306, Jan. 20, 1970, abandoned. This application Jan. 24, 1972, Ser. No. 220,326

Int. Cl. A41b *9/00*; H05f *3/00*

U.S. Cl. 2—73 **18 Claims**



An anti-static garment such as an undergarment intended to be worn by a person having means for precluding the accumulation of static electricity. The garment fabric has a hand substantially similar to the hand of conventional garment fabrics while providing the desirable static elimination by incorporation therein of distributed textile-like conductive fiber. The fiber may be substantially uniformly distributed in the fabric or may be localized, such as in the stitching and/or trim portions of the garment.

3,699,591

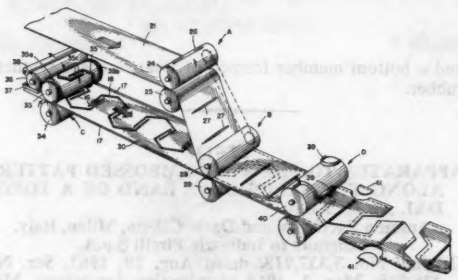
METHOD OF MAKING DISPOSABLE GARMENTS

Stephen H. Breitkopf, North Brunswick, and Michael Scaduto, North Arlington, both of N.J., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed March 10, 1971, Ser. No. 122,826

Int. Cl. A41d *13/00*

U.S. Cl. 2—243 R **23 Claims**



A disposable garment which is formed from foldable sheet material supplied from two converging webs, one web providing the material primarily for the back panel of the garment and the other web providing the material primarily for the garment's front panel. As the webs converge, they are sealed together along lines defining the outline of the desired garment. Immediately prior to the sealing step, one of the webs is transversely slit, the length of each slit being less than the width of the web and terminating short of the web's longitudinal edges. After the sealing step has taken place, both webs are cut just beyond the sealing lines to free the finished garment, the cutting lines of such final step intersecting the previously formed slit with the result that the finish garment has a divided rear (or front) panel.

ERRATA

For Classes 3—1 and 4—288 see:
Patents Nos. 3,700,380 and 3,700,381

3,699,592

MARINE TOILET ASSEMBLY

Edward F. Minchak, Rocky River, Ohio, assignor to Preformed Line Products Company, Cleveland, Ohio

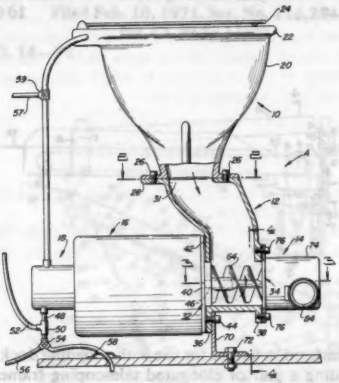
Filed Dec. 21, 1970, Ser. No. 100,032

Int. Cl. E03d *11/11*, *11/10*

U.S. Cl. 4—90 **12 Claims**

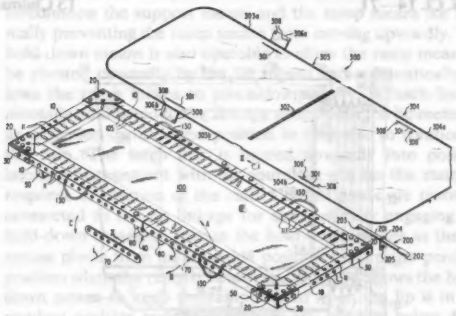
The drawings show a marine toilet assembly comprising a first tubular member having an open upper end connected to and supporting a conventional toilet bowl and seat assembly. The lower end of the tubular member has an outlet opening facing generally horizontally and a motor is releasably connected to the tubular member on the side opposite the outlet with its drive shaft extending generally horizontally and aligned with the outlet opening. Positioned in the lower end of the tubular member and releasably connected to the drive shaft is a rotary macerator and waste pump assembly with the waste pump located outwardly of the outlet. A housing member encloses the waste pump and is sealingly and

releasably connected to the outlet opening on the tubular member. The housing member has a discharge opening adapted to receive the output from the waste pump. A flush



water pump is connected to the motor at the side opposite the outlet and means are provided for supplying treatment chemicals to the water supplied to the flush water pump.

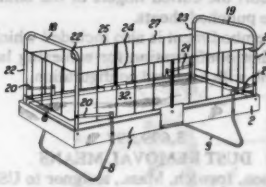
3,699,593
FOLDABLE BED STRUCTURE
Hans Oetiker, 21 Oberdorfstrasse, Horgen, Switzerland
Filed Oct. 30, 1969, Ser. No. 872,703
Int. Cl. A61g 7/00; A47c 17/40
U.S. Cl. 5—66 **18 Claims**



A bed made from standard structural parts, detachably connected together, which is adapted to be pivoted about a central pivot axis to permit insertion into a case formed by the mattress cover.

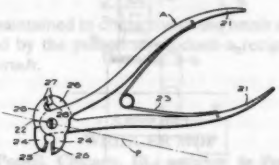
3,699,594
FOLDING BED
William Matthey-Doret, La Verrerie, F-21, Velars sur Ouche, France
Filed Nov. 3, 1969, Ser. No. 873,479
Claims priority, application France, Nov., 1968, 68173639; Dec., 1968, 68182125
Int. Cl. A47d 9/00, 7/00; A47c 27/08
U.S. Cl. 5—99 R **9 Claims**

Portable cot comprising two half-shells foldable together to form a valise. Frame members for the cot are retractable into said valise and folding feet on the half-shells are automatically



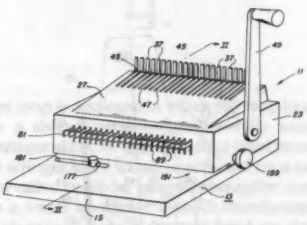
positioned upon opening the frame members. The feet can also serve as carrying handles.

3,699,595
COMBINATION CLOSING AND OPENING PLIERS FOR REVERSIBLE MATRIX BAND CLAMP
Benjamin F. Tofflemire, 41301 Crest Drive, Hemet, Calif.
Filed June 1, 1970, Ser. No. 41,961
Int. Cl. B25b 7/22
U.S. Cl. 7—3 **1 Claim**



A combination closing and opening pliers for reversible matrix band clamp, wherein a pair of operating handles are swingably secured together for closing and opening movements, these pliers having a pair of clamp-closing beaks arranged to straddle legs of a substantially U-shaped clamp so as to crimp the clamp upon a dental matrix band, and the pliers further having a pair of clamp-opening beaks arranged to be applied over an arch interconnecting the legs of the clamp so as to compress the arch and thereby spread the legs apart to release the clamp from the band.

3,699,596
PUNCHING AND BINDING MACHINE
John W. Lyon, 110 Taylor Drive, Hot Springs, Ark.
Continuation-in-part of Ser. No. 859,047, Sept. 18, 1969, abandoned. This application March 22, 1971, Ser. No. 126,568
Int. Cl. B42c 19/00
U.S. Cl. 11—1 AC **20 Claims**



A combination punching and binding machine for gang punching a stack of sheets and binding the sheets with a ring-like plastic binding element. The machine has a manually actuated lever which, when operated in one direction, actuates the punches, and when operated in the opposite direction, first

moves laterally a comb upon which the binding element is placed and continued movement actuates a plurality of finger elements to uncurl the curled fingers of the binding element for receiving the punched sheets.

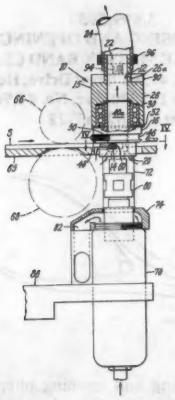
An alternate embodiment is also included which comprises substituting a first configuration for achieving lateral movement of the comb with a second configuration.

3,699,597

DUST REMOVAL MEANS

Edward S. Babson, Ipswich, Mass., assignor to USM Corporation, Boston, Mass.

Filed June 10, 1971, Ser. No. 151,810
Int. Cl. A43d 7/00
U.S. Cl. 12—89 **9 Claims**



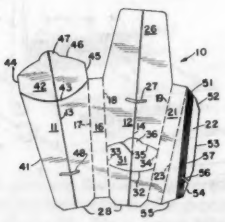
A head assembly for continuously removing dust accumulating on margins of shoe soles as a result of operations carried out on the margins by a rotary tool. The head is adapted to fit over the tool and includes a feed or guide slot for introducing marginal portions of soles to the interior of the head. The feed slot is located intermediate of air intake means and air exhaust means, and adjustment means is provided for orienting a sole as fed through the feeding slot.

3,699,598

BOOT SUPPORT AND SEPARATOR

Glenn E. Struble, Fairfield, Ohio, assignor to Diamond International Corporation, New York, N.Y.

Filed Jan. 28, 1971, Ser. No. 110,679
Int. Cl. A43d 5/00
U.S. Cl. 12—114.6 **21 Claims**



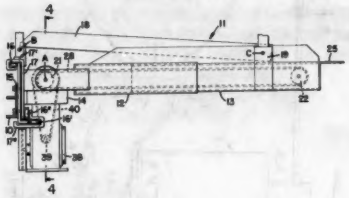
A support fitted into a boot following the boot contour for use during packing and shipping. A tongue portion extending above the boot top receives the toe portion of the mated boot to maintain the boots separated from each other.

3,699,599

DROP PLATFORM STRUCTURE FOR A LOADING DOCK

Sidney D. Lapham, 2324 Tice Creek Dr., Walnut Creek, Calif.

Filed March 15, 1971, Ser. No. 124,050
Int. Cl. B65g 11/00
U.S. Cl. 14—71 **10 Claims**



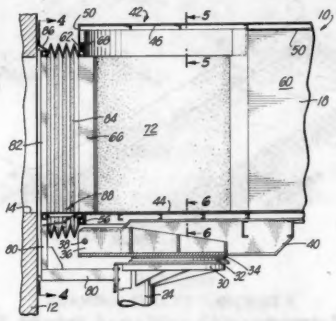
A drop platform structure for use with a loading dock is provided including a pair of elongated telescoping frame members, one of the members being pivotally secured to the dock and the other member being pivotally secured to a brace which is also pivotally secured to the dock. An elongated platform is slidably disposed with respect to the frame members and, upon retraction thereof, automatically telescopes the frame members so as to raise them from a generally horizontal to a generally vertical position.

3,699,600

LOADING BRIDGE STRUCTURE

Peter T. Gacs, Palos Verdes Peninsula, and Paul P. Shirzad, Palos Verdes, both of Calif., assignors to General Steel Industries, Inc., St. Louis, Mo.

Filed Dec. 30, 1970, Ser. No. 102,599
Int. Cl. B65g 11/00
U.S. Cl. 14—71 **13 Claims**



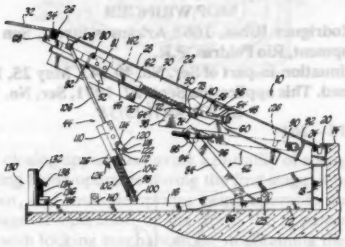
A swing bridge type of aircraft loading bridge structure for use in providing access between an aircraft and a terminal can be constructed so as to minimize the amount of bridge slope by using a rotunda structure attached to a loading bridge so as to move in conjunction with the bridge. A first or rotunda support is used to rotatably carry a secondary support so that this secondary support may be rotated in a horizontal plane and the rotunda structure is rotatably mounted on the secondary support so as to be capable of being rotated in a vertical plane. The axis of the vertical rotation is preferably located adjacent to the terminal. Drive means are connected to the bridge for rotating the bridge horizontally and vertically with respect to the terminal.

3,699,601

DOCKBOARD ASSEMBLY

Robert W. Hecker, Jr., Clare, Mich., and Robert C. Beckwith, Scotts Bluff, Nebr., assignors to Loomis Machine Company, Clare, Mich.

Filed Feb. 10, 1971, Ser. No. 114,264
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 13 Claims



A dockboard assembly including a support means, a ramp means pivotally connected at a first end to the support means and extending to a second end, and lip means pivotally connected to the second end of the ramp means for pivotal movement between an extended cantilevered position and a pendant position. A cam is rotatably connected to the ramp means and a lift arm is pivotally connected to the support means and has a roller at the other end engaging the cam for pivoting the ramp means upwardly from any position in which the ramp means is disposed. A releasable hold-down means interconnects the support means and the ramp means for normally preventing the ramp means from moving upwardly. The hold-down means is also operable to allow the ramp means to be pivoted upwardly by the lift means and automatically allows the ramp means to pivot downwardly. A latch link is pivotally connected to the linkage with moves the lip means to an extended cantilevered position in response to rotation of the cam. The latch link is moved upwardly into positive latching engagement with an abutment pin on the ramp in response to rotation of the cam. Control pawls are pivotally connected to the lip linkage for automatically engaging the hold-down means to release the hold-down means as the lip means pivots from an extended position toward the pendent position when the ramp is below the dock and allows the hold-down means to keep the ramp locked when the lip is in the pendant position and the ramp is in any position below dock level.

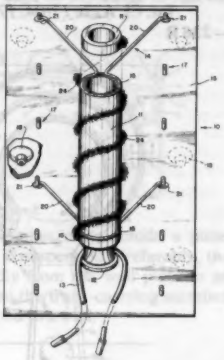
3,699,602

THERAPEUTIC BATH BACK BRUSH AND PROCESS OF USING SAME

Malcolm R. Cameron, 1340 Cerise Avenue, Hawthorne, Calif.

Filed March 4, 1971, Ser. No. 120,905
Int. Cl. A61h *7/00*
U.S. Cl. 15—21 D 5 Claims

A cylindrical brush having bristles located in a helical column upon the surface of the cylinder and a pulley fastened at the base of the cylinder with a cord passing through the grooved rim of the pulley. The brush is adjustably mounted on a plate having suction cups on the side of the plate opposite the brush. The suction cups secure the plate to a shower wall and the brush is adjusted to the desired height of a body portion of a person. The body portion is washed and massaged



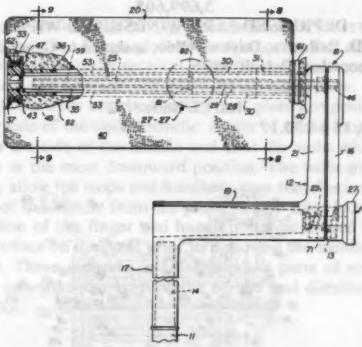
when it is maintained in contact with the brush and the cord is reciprocated by the person to produce a reciprocating rotation of the brush.

3,699,603

WRINGER MOP

Samuel J. Popell, Chicago, Ill., assignor to Popell Brothers, Inc., Chicago, Ill.

Filed Feb. 26, 1971, Ser. No. 119,160
Int. Cl. A47l *13/142*
U.S. Cl. 15—120 R 15 Claims



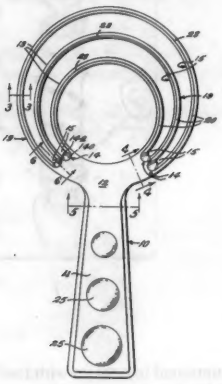
A wringer mop is disclosed in which the mop head, a sponge encased in a cloth sleeve, is cantileverally mounted on a rotatable wringer shaft. A U-shaped mop head mount supports a rotatable wringer shaft which is actuated by a crank which, in the inoperative position, permits the entire mop to be inserted into a water container without interference from the crank. Spools at both ends of the mop head are slotted so that the mop head can flip-flop backwardly and forwardly thereby permitting both sides to be worked. Additional slots are provided to secure the mop head against rotation on the cantilever wringer arm in a position approximately perpendicular with the mop handle facilitating the use of the mop, and more particularly its offset mop head, to clean the tops of doors, window sills, valances, and the like.

3,699,604

BUTCHERS' BONE DUST SCRAPER

Charles J. Hunt, Morning View, Ky., assignor to Vulcan Corporation, Cincinnati, Ohio

Filed March 22, 1971, Ser. No. 126,585
Int. Cl. A22c *17/04, 17/00*
U.S. Cl. 15—236 R **3 Claims**



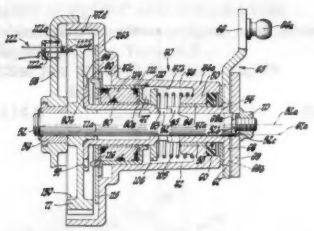
A one-piece plastic butchers' hand tool for the removal of bone dust from newly cut and sawn meat surfaces is provided and comprises spaced apart, flexible scraper blades mounted, one within the other, on the cross-head part of a T-shaped handle; the terminal ends of each of said blades having integral connections with the opposed sides of the cross-head part of the handle. The blades are spaced from each other at said cross-head connections a distance that provides relatively wide clearance areas between the blades for sanitary cleaning of the tool.

3,699,605

DEPRESSED PARK WINDSHIELD WIPER

James D. Bellware, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 18, 1971, Ser. No. 154,344
Int. Cl. B60s *1/02*
U.S. Cl. 15—250.17 **3 Claims**



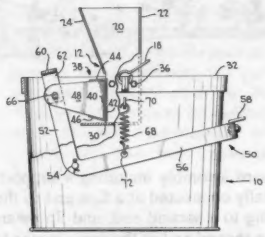
In a preferred form, this disclosure relates to an actuating mechanism for use in oscillating a pair of windshield wipers between inboard and outboard positions during running operation and for moving the wipers to a depressed park position spaced from the inboard position when wiper operation is being terminated. The actuating mechanism includes the housing means, a drive shaft rotatably supported by the housing means, a drive member, a drive gear drivingly connected to the drive shaft, an eccentric supported for rotation relative to the drive shaft, a crank arm rotatably journaled on the eccentric, means for drivingly connecting the crank arm to the drive shaft and for permitting the crank arm to move radially with respect to the drive shaft, and an shiftable sleeve drivingly connected with the eccentric and being shiftable between a first position in which it is drivingly engaged with the drive gear to cause the eccentric to be rotated in unison with the drive shaft and the crank arm to be rotated about an orbit of a given radius during running operation of the wipers and a second position in which it is disengaged from the drive gear to cause the crank arm to be rotated relative to the eccentric and moved radially of the drive shaft to increase the radius or throw of the crank arm to effect movement of the wipers to their park position.

3,699,606

MOP WRINGER

Carlos Rodriguez Ribas, 1663 Arkansas Street, San Gerardo Development, Rio Peidras, P.R.

Continuation-in-part of Ser. No. 40,243, May 25, 1970, abandoned. This application Sept. 27, 1971, Ser. No. 184,119
Int. Cl. A47l *13/58*
U.S. Cl. 15—261 **5 Claims**



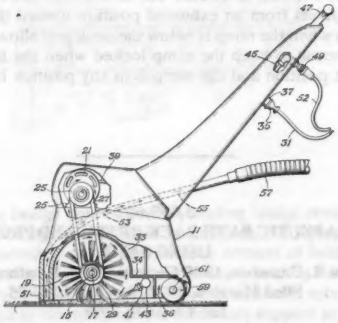
A mop wringer including a substantially funnel-shaped member with perforations at the lower end portion of the walls thereof, a piston member cooperating with the perforated walls of the funnel for wringing a mop, and foot operated lever means for moving the piston.

3,699,607

CARPET CLEANING APPARATUS

Frank E. Putt, Hurst, Tex., assignor to Town & Country Cleaners Franchises, Inc., Hurst, Tex.

Filed July 7, 1970, Ser. No. 52,941
Int. Cl. A47l *7/00*
U.S. Cl. 15—320 **15 Claims**



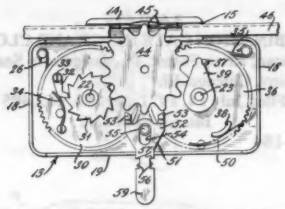
Apparatus for cleaning floor surfaces, especially carpets, with a cylindrical brush, a plurality of fluid nozzles directed tangentially adjacent the brush near floor level, and a vacuum nozzle for retracting the fluid from the floor surface, all of which are arranged cooperatively to retract a surprisingly large percentage of the moisture from the floor surface.

3,699,608

AUTOMATIC DOOR CLOSER

Charles A. Schwarz, Enid, Okla., assignor to Sooner Door Hardware Manufacturing Company, Hennessey, Okla.

Filed Oct. 23, 1970, Ser. No. 83,576
Int. Cl. E05f 1/08
U.S. Cl. 16—79 **8 Claims**



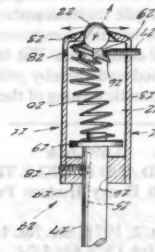
A door closing apparatus having a plurality of springs with a single spring being operable during the first stage of operation of the door, and multiple springs being operable during the second stage of operation of the door, the apparatus being provided with locking mechanism for maintaining the door in fully opened, fully closed, or any intermediate position.

3,699,609

SPRING LOADED CASTER FOR SHOP TOOLS, BAR STOOLS AND THE LIKE

William L. Spatz, Route 2, P.O. Box 194-A, Montevallo, Ala.

Substitute for Ser. No. 801,982, Feb. 25, 1969, abandoned.
This application April 12, 1971, Ser. No. 133,245
Int. Cl. A47b 91/00
U.S. Cl. 16—44 **1 Claim**



An improved caster for the bottom of a stool or other furniture item, the caster comprising a casing containing a compression spring which bears adjustably against a spherical steel ball engaging a floor or supporting surface.

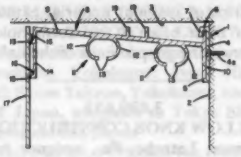
3,699,610

DRAPERY TRACK ASSEMBLY

Bernard M. Harby, West Vancouver, British Columbia, Canada, assignor to Bernard Harby Limited, Vancouver, British Columbia, Canada

Filed Sept. 8, 1969, Ser. No. 856,024
Claims priority, application Canada, June 23, 1969, 055,071
Int. Cl. A47h 15/00; E05d 13/02
U.S. Cl. 16—94 D **1 Claim**

A drapery track assembly includes a wall plate securable to a wall, and a track-carrying member having at least one track for carrying curtain runners extending longitudinally of the member, said wall plate having interlocking means and said track-carrying member having interlocking means co-operable with the interlocking means of said wall plate by an interlocking action to secure the track-carrying member to the wall plate. The interlocking means of the track-carrying member may include a substantially vertical flange, and the interlocking means of the wall plate may include a lower forwardly projecting ledge and an upper downwardly projecting lip to enable the upper edge of the flange to be positioned behind the lip and the lower edge of the flange to rest on the ledge.



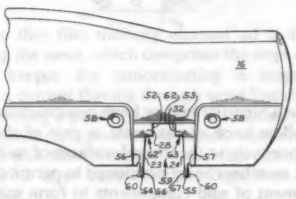
The track-carrying member may include a plate-like body from which the track is suspended. Preferably, the plate-like body extends forwardly from the wall plate in an upwardly inclined direction when the track-carrying member is secured to the wall plate attached to a wall.

3,699,611

CASKET HANDLE RETAINED BY SPREADABLE WEBS

Bennie R. Johnson, R. R. 3, Connersville, Ind.

Filed Feb. 12, 1971, Ser. No. 114,777
Int. Cl. A47b 95/02
U.S. Cl. 16—114 **12 Claims**



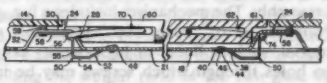
A casket handle hinge having spreadable webs for retaining the casket handle. A base plate securable to a casket side wall removably and hingedly receives a handle. A finger connected to the handle projects into a cavity formed in the plate. A pair of spreadable webs attached to the base plate are positioned on either side of the casket handle. A pair of raised stops project from the side of the handle and abut the webs when the handle is in the most downward position. The webs must be spread to allow the stops and handle to pass therebetween for removal of the handle from the plate. A stop edge located at the junction of the finger and handle must be moved past a curved surface on the plate prior to removing the handle from the plate. Three separate and independent pairs of surfaces limit the upward movement of the handle and distribute the lifting force.

3,699,612

HANDLE FASTENING ASSEMBLY

Harold G. Hanley, Bensenville, and Edward E. Williamson, St. Charles, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed March 4, 1971, Ser. No. 120,988
Int. Cl. A47b 95/02
U.S. Cl. 16—115 **15 Claims**



The assembly includes a handle, base plate, and fastening links. Horizontal slots extend laterally through the end por-

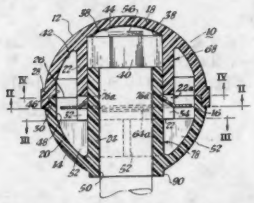
tions of the handle. Rectangular links having gaps provided in the short sides thereof are mounted through each slot in the handle. The base plate includes integrally formed surfaces or brackets having first portions with a lateral dimension less than the gap and second portions with a lateral dimension greater than the gap but less than the distance between the long sides of the link so that the links can fasten the handle thereto. Thin strips of resilient material extend beneath the inner surface of each bracket and form holding chambers therewith to restrain the gapped ends of the links.

3,699,613

HOLLOW KNOB CONSTRUCTIONS

Harvey G. Skinner, Latrobe, Pa., assignor to Vulcan, Inc., Latrobe, Pa.

Filed March 20, 1970, Ser. No. 21,414
Int. Cl. A47b *95/02*
U.S. Cl. 16—121 **14 Claims**



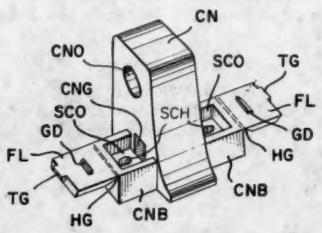
I disclose a bipartite hollow knob construction comprising a pair of hollow knob components, a pair of shank members joined respectively to the inward surfaces of said components, said shank members being positioned to permit complementary engagement of said components to form said knob structure, and fastening means engageable with the outer surfaces of each of said shank members to retain said components in their assembled position.

3,699,614

TOILET SEAT COVER MOUNTING

Henry Marshall Stairs, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.

Filed April 20, 1970, Ser. No. 29,933
Int. Cl. E05d *7/02*
U.S. Cl. 16—128 **3 Claims**



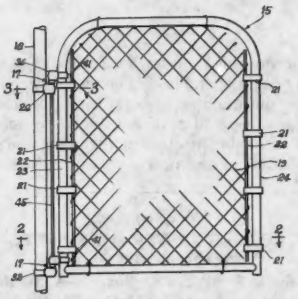
Covers a mechanism for connecting a toilet seat cover to a toilet seat assembly. The mechanism includes a lug, sometimes called a "connector" or "cover leaf," preferably made of a plastic material, such as linear or high density polyethylene, having two holes through which screws may be inserted to affix the lug to the seat cover. The lug also embodies flaps which are integral with the body of the lug and yet are moveable over an angle, such as 180°, for covering and concealing the heads of the screws. Two identical lugs would ordinarily be used with each toilet seat cover. By concealing the metal screws, the lug mechanism presents a finished appearance to the toilet seat and its cover and, more importantly, the flaps of the lugs prevent the accumulation of dirt in and around the screws. The employment of hinged flaps permits the easy installation of the lugs and will permit removal of the screws.

3,699,615

COMBINATION GATE HINGE AND CLOSER

Alan W. Duncan, River Forest, Ill., assignor to Sears, Roebuck and Company, Chicago, Ill.

Filed July 14, 1971, Ser. No. 162,495
Int. Cl. E05f *1/12*
U.S. Cl. 16—184 **7 Claims**



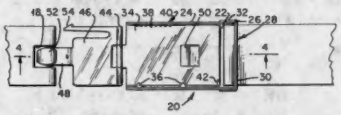
A gate hinge and closer means including upper and lower hinge assemblies, each including a bearing component and a hanger component, the bearing component being attached by a strap to a fence post and the hanger component being similarly attached to a gate frame member. A torsion bar has one end received in the bearing component and the other end received in the hanger component. The torsion bar is twisted when the gate is opened and thereby provides the necessary force for effecting automatic closing of the gate.

3,699,616

WRIST BAND AND BUCKLE THEREFOR

Harry Kalinsky, 3530 Henry Hudson Parkway, New York, N.Y.

Filed Aug. 2, 1971, Ser. No. 168,130
Int. Cl. A44c *5/24*
U.S. Cl. 24—71 J **8 Claims**

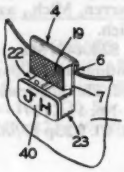


A wrist band buckle having a trough-shaped casing which is securable by one open end to an end of a wrist band and has a cover hinged thereto at said end. A ratchet is formed in a side of the casing and a pair of plates hingedly interengaged at one end are slidably supported within the casing for limited movement into and out of its other end, with the hinged ends of the plates facing said other end. The upper of the plates has a hook at its free end for engaging an opening in the other end of the wrist band and is releasably engaged by said free end on the lower plate. The upper of the plates also has a resiliently connected pawl engagable on the ratchet and disengagable therefrom upon the lifting and disengagement of the hook-end of the upper plate from the lower plate.

3,699,617
CONNECTING DEVICE FOR ARTICLES OF CLOTHING

John M. Hofmeister, 931 Marion N. W., Massillon, Ohio

Filed Jan. 29, 1971, Ser. No. 110,968
Int. Cl. A44b *21/00*
U.S. Cl. 24—81 GS 7 Claims

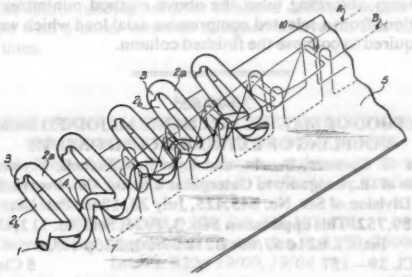


A connecting device for detachably joining together two articles of clothing for laundering, such as socks. The connecting device has two similar connecting members each of which is permanently attached to one garment of a pair. The connecting members each have a single stud or a pair of studs at one end which pierces one of the garments. Flanges at the opposite end of each member lock the studs in place after the member is folded upon itself securing the garment therebetween. Attachment plugs are formed on each connecting member and are snapped together detachably retaining the two garments in their proper pair.

3,699,618
ROW OF FASTENER ELEMENTS FOR A SLIDE

Horst Jakob, Choisy-le-Roi, France, assignor to Societe Financiere Franciase de Licences et Breveta, Choisy-le-Roi, (Val de Marne), France

Filed April 12, 1971, Ser. No. 133,174
Claims priority, application France, Aug. 13, 1970, 7013191
Int. Cl. A44b *19/12, 19/34*
U.S. Cl. 24—205.1 C 2 Claims

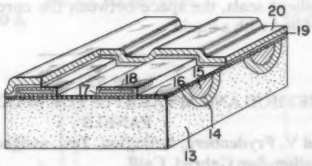


A row of fastener elements for a slide fastener comprises a continuous spiral-shaped thread having a varying pitch, each whorl of the spiral thread having two legs which are substantially superimposed, and each whorl being separated from each other whorl, each whorl having at a first end portion thereof a deformation to serve as a tooth of a fastener element. In such a construction, the connecting sections between the successive whorls, opposite the teeth, each have a respective bend facing towards the teeth and the totality of said bends forms a series of notches along the corresponding longitudinal edge of the row of fastener elements. When the row of fastener elements is secured by stitching onto a backing tape, the stitching consists of two parallel longitudinal rows, one of said rows being at an intermediate point in the space between the teeth and the connecting sections, preferably close to the connecting sections, and the other being along the edge of the row of fastener elements opposite to the teeth and disposed inside the notches. Advantageously, the stitching is double chain-stitch made with two needles, the chains being positioned over the end of the whorls opposite to the teeth.

3,699,619
METHOD FOR MANUFACTURING A MAGNETIC THIN FILM MEMORY ELEMENT

Nobuaki Yasuda, Zushi-shi; Takenobu Ogawa, Kawasaki-shi; Yoshio Murakami, Yokohama; Iwao Higashinakagawa, Kawasaki-shi; Syozo Takeno, Yokohama, and Norio Tanaka, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed July 29, 1970, Ser. No. 59,293
Claims priority, application Japan, July 30, 1969, 44/59790
Int. Cl. H01f *7/06*
U.S. Cl. 29—604 6 Claims

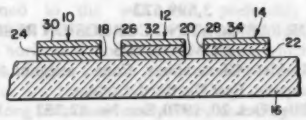


A magnetic thin film memory element ad a method for manufacturing the same, which comprises the steps of forming a magnetic keeper for concentrating a magnetic flux generated by a current flowing through word lines beside said word lines, forming a plurality of digit lines closely intersecting said word lines through a first insulator, which is encircled by a magnetic thin film forming a closed flux path, and forming a conductive layer contacting the digit lines through a second insulator.

3,699,620
METHOD FOR OBTAINING THE DIELECTRIC CONSTANT OF FRIT CAPACITORS

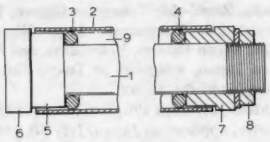
John W. Asher, Elmira, and Andrew Herczog, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 16, 1968, Ser. No. 729,800
Int. Cl. H01g *13/00*
U.S. Cl. 29—25.42 3 Claims



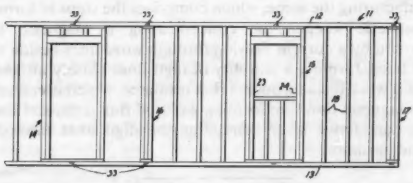
A frit capacitor of either the discrete or integrated microcircuit variety having a ferroelectric glass-ceramic dielectric whose dielectric constant is of intermediate value between about 20 and 400. The desired value of dielectric constant is accurately obtained in a readily reproducible manner by mixing a batch containing appropriate quantities of stable noncrystallizable glass particles and glass particles capable of forming a ferroelectric crystal phase. The desired dielectric constant is obtained by subjecting the batch to heat treatment. By controlling the weight ratio of the two glass components during the batch preparation, individual capacitor dielectrics having different dielectric constants can be provided utilizing the same firing schedule for each.

3,699,621
ROLLERS
Kenneth Clarke, Knebworth, and Ronald Bevan, Welwyn, both of England, assignors to Imperial Chemical Industries Limited, London, England
Filed Dec. 16, 1970, Ser. No. 98,652
Int. Cl. B21b 27/00
U.S. Cl. 29—113 R 9 Claims



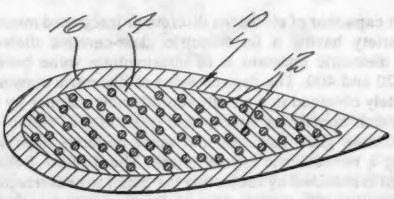
A resilient roller consisting of a cylindrical core member and a thin sleeve surrounding the core and spaced therefrom by resilient seals, the space between the core and the sleeve being filled with a liquid.

3,699,622
METHOD AND APPARATUS FOR MAKING WALL PANELS
Donald V. Frydenberg, Arlington, Tex., assignor to Clary Corporation, San Gabriel, Calif.
Filed May 3, 1971, Ser. No. 139,731
Int. Cl. B23p 17/00, 19/00, 21/00
U.S. Cl. 29—155 R 14 Claims



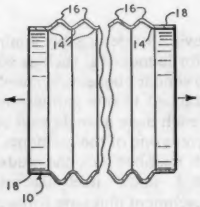
Disclosed method and apparatus continuously forms building wall panels using pre-formed sub-assemblies having centrally positioned locators thereon. Locating notches are formed in the top and bottom frame plate members at the centers for various window, door and post components. The plate members are fed continuously and as the locators drop into the notches, thereby properly locating the sub-assemblies, they are carried to a nailing station where they are fastened to the plate members.

3,699,623
METHOD FOR FABRICATING CORROSION RESISTANT COMPOSITES
Kenneth G. Kreider, Glastonbury, Conn., assignor to United Aircraft Company, East Hartford, Conn.
Filed Oct. 20, 1970, Ser. No. 82,252
Int. Cl. B23p 15/02, 15/04
U.S. Cl. 29—156.8 B 4 Claims



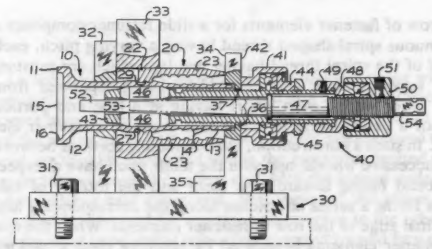
A method for fabricating erosion and corrosion resistant filament reinforced composite articles having a matrix of aluminum or magnesium or alloys thereof for use in gas turbine engines wherein a protective sheath of titanium foil is diffusion bonded to the outer surface of the matrix.

3,699,624
STRETCH METHOD FOR MAKING A TUBULAR PRODUCT
William J. De Gain, Warren, Mich., assignor to Koppy Corporation, Ferndale, Mich.
Division of Ser. No. 824,440, May 14, 1969, Pat. No. 3,577,621, which is a continuation-in-part of Ser. No. 627,718, April 3, 1967, abandoned. This application Feb. 10, 1971, Ser. No. 114,107
Int. Cl. B23p 17/00
U.S. Cl. 29—155 C 9 Claims



A tubular metal blank to be formed into a vehicle steering column or other stress-subjectable corrugated tubular product is first deformed by radially inwardly moving dies or other forming devices to produce a plurality of substantially equally spaced shallow annular depressions separated by slightly raised crowns. The blank is then axially compressed to form and close a plurality of convolutions under a selected load within predetermined limits and to a selected closed length within predetermined limits, the variations being dependent on the strength of the material. Finally, the blank is stretched using a selected stretch pressure within predetermined limits and to a selected expanded length within predetermined limits, expanding the convolutions to a plurality of generally similar spaced corrugations. When the end product is used as an energy absorbing tube, the above method minimizes the variations from a selected compressive axial load which would be required to collapse the finished column.

3,699,625
METHOD OF MAKING MECHANICAL JOINED HOSE COUPLING OF EXTRUDED COMPONENTS
Blaine G. Spencer, Peoria, and Lyle B. Clinebell, Wyoming, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Division of Ser. No. 845,425, July 28, 1969, Pat. No. 3,589,752. This application Feb. 3, 1971, Ser. No. 112,483
Int. Cl. B21d 53/00; B21k 29/00; B23p 15/26
U.S. Cl. 29—157 5 Claims



In a hose coupling having an extruded stem and an extruded collet which are joined so hydraulic hose can be clamped against the stem by the collet's gripping fingers when the hose

is inserted therebetween, a mechanical connection between the stem and collet is effected by expanding a midportion of the stem into the peripheral dentured and grooved wall of an aperture in a radial flange forming part of the collet. The method of expanding the mid-portion of the stem and the configuration of dentured and grooved wall of the aperture insures a suitable mechanical joint between the stem and collet for a coupling operating at 4,500 psi or above.

3,699,626

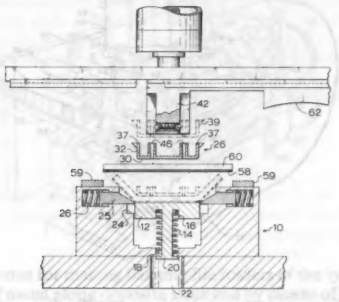
FABRIC APPLYING APPARATUS

Eric Michael Roth, R. R. #1, Unionville, Ontario, Canada

Filed Dec. 16, 1970, Ser. No. 98,591

Int. Cl. B23p *19/00, 11/00*

U.S. Cl. 29—200 B **14 Claims**



A machine for attaching fabric to a member having a main wall, side walls extending therefrom and fabric retaining and engaging means on the side wall, has a platform movable from an extended to a retracted position relative to a base, with fabric and then the main wall thereon, and the machine has transversely movable lips biased inwardly and located to fold the fabric along the side walls and into engagement with said engagement and retaining means during travel of said members toward retracted position.

The fabric holding member as above defined may be combined with a cover member designed to overlie and contact the tines.

3,699,627

PROCESSING MACHINE FOR THE PRODUCTION OF SMALL COILS OF METAL OR OTHER WIRE

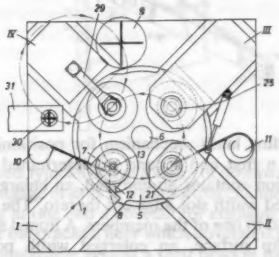
Alfred Jouin, Villiers/Marne, France, assignor to Societe A Responsabilite Limitee: Forges & Trefilleries de Conflandey, Paris, France

Filed Dec. 28, 1970, Ser. No. 101,628

Claims priority, application France, Jan. 8, 1970, 7000607

Int. Cl. B23p *19/00, 19/04*

U.S. Cl. 29—200 B **8 Claims**



A processing machine for producing small coils comprising a ring of wire maintained in a cage formed from a cross arm member whose arms are folded so as to retain the ring of wire and to serve as a reel. The machine includes four work stations arranged at 90° relatively to one another about a processing table including four dies arranged at 90° relative to one another and in each of which a spindle carrying a winding mandril is slidably mounted. The winding is effected at the first station, the bending and a first folding of the arms or the cross arm member and the cutting of the wire are effected at a second station, a second folding of the arms and the clamping of the ring of wire being effected at a third station and the removal of the completed coil being effected at the fourth station. Dispensing device for labels and for supporting rings may be provided at the first and second stations respectively.

3,699,628

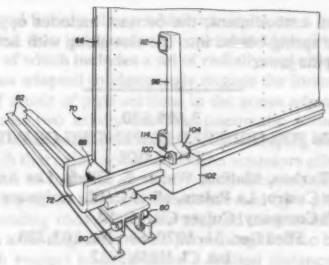
VERTICAL ASSEMBLY APPARATUS

Gregory N. Gollobitz, Boca Raton, Fla., assignor to Behring Corporation, Fort Lauderdale, Fla.

Filed April 5, 1971, Ser. No. 130,970

Int. Cl. B23p *19/00*

U.S. Cl. 29—200 A **12 Claims**



Apparatus for assembling wall units for prefabricated buildings including a welding station where metal beams are assembled and welded together to form a wall unit, and a sheathing station where sheathing such as wallboard is applied to the wall units and fastened with screws. The wall units ride on a track from the welding station to the sheathing station, and the beams are assembled on the track at the welding station. The beams are assembled in a squared configuration with cap beams at top and bottom, and during assembly, the top beam is held above the assembly area by movable magnets. After the lower cap beam and the vertical beams are put in place, the upper cap beam is lowered by moving the magnets as with a solenoid to place the top beam on the ends of the vertical beams. The beams are then welded together. The wall unit is shifted to the sheathing station, and sheathing material is fastened to the wall unit, preferably with power screwdrivers. The screwdrivers may be mounted for both vertical and horizontal movement on a frame which rides on rails and shifts along a section of the assembly track. Completed wall units are transferred to holding units which may be moved along rails transversely of the assembly track.

3,699,629

ELECTRICAL COMPONENT INSERTION-REMOVAL TOOL

Jesse C. Hood, Jr., 817 Dumaine Avenue, San Dimas, Calif., and Harold D. Palmer, 25942 Corriente Lane, Mission Viejo, Calif.

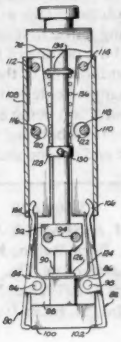
Filed Nov. 2, 1970, Ser. No. 86,206

Int. Cl. H05k *13/04*

U.S. Cl. 29—203 H **6 Claims**

A tool is disclosed for use in placing and removing electrical components, as integrated circuit packages. A body, defining opposed substantially-parallel flat surfaces terminates in a slot for frictionally holding an integrated circuit package. A spring biased plunger engages the integrated circuit package either

to force it into a circuit-board receptacle or for withdrawal therefrom. The tool is disclosed in an insertion form and in an integrated form for both insertion and withdrawal. In the



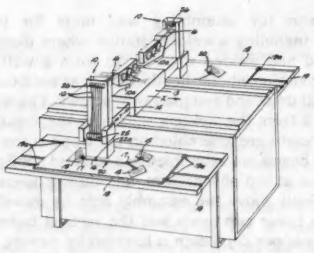
withdrawal embodiment, the contact includes opposed jaws which are spring biased into the slot along with actuators for spreading the jaws.

3,699,630

SYSTEM FOR ORDERED DISPENSING OF WIRE AND THE LIKE

John W. Tarbox, Malibu; Walter E. Hinds, Los Angeles, and Rodolfo Castro, La Palma, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 31, 1970, Ser. No. 103,233
Int. Cl. H05k *3/32*
U.S. Cl. 29—203 MW **35 Claims**



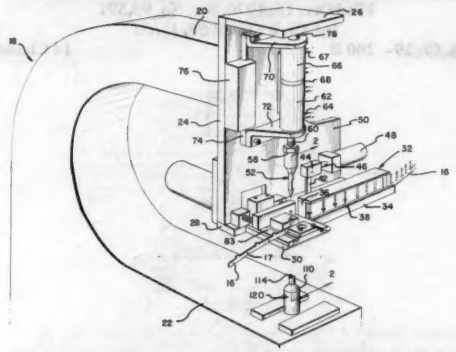
A wire dispensing system provides for ordered dispensing and forming of wires along predetermined paths to produce cables and including automating the production of cable harnesses. A wire dispensing head is controlled to selectively dispense wires from a group of supply spools, laying the wire along predetermined paths according to the desired harness pattern configuration, cutting the wires to conform to the individual path lengths, and securing the wires at respective termination sites. The wire dispensing head includes feed tubes selectively actuated to secure the wires at the termination sites wherein movements of the dispensing head are controlled to accurately move the selected feed tubes along the paths determined by the harness pattern configuration. The desired length of an individual precoded wire is determined by optically sensing the configuration of a wire mark which controls wire pay-out by a rotatable capstan while feed rate the tension of the wires is regulated by the same capstan at a low level capable of accurately locating the wires along the wire layout paths of the cable harness wherein the tension is regulated so as to not exceed the level of wire retention at the termination sites. The termination sites include openings having resilient retaining means comprising a slit pattern in neopreme at each opening for receiving and the end portion of a feed tube and retaining wires on withdrawal of the feed tube.

3,699,631

APPARATUS FOR ASSEMBLING ARTICLES IN STRIP FORM TO WORKPIECES

Mervin Leonard Shughart, Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 869,744, Oct. 27, 1969, abandoned. This application April 26, 1971, Ser. No. 137,384
Claims priority, application Great Britain, Sept. 7, 1970, 42721/70
Int. Cl. H05k *3/30*
U.S. Cl. 29—203 B **16 Claims**



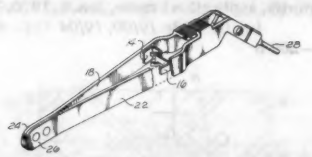
Assembling apparatus comprises strip feeding means for feeding a strip of articles along a predetermined path which extends above a supported workpiece. Assembly is carried out by means of a punch which is movable, in two stages, towards the workpiece. The inserting punch moves downwardly, in a first stage, and grasps the leading article of the strip. The carrier strip to which the article is attached, is then moved laterally while the article is supported against movement thereby to shear the leading article from the strip. The punch then moves downwardly through the remainder of its stroke to carry the article towards the workpiece and assemble it thereto. The article may comprise e.g. a terminal pin and the workpiece a printed circuit board.

3,699,632

OVERRIDING LATCH MECHANISM

John William Anhalt, La Crescenta, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 30, 1971, Ser. No. 167,565
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 H **5 Claims**



An overriding latch mechanism for positioning a pair of members in a first and second predetermined positions. A bracket portion contains an end wall, an enlarged width slot and a reduced width slot adjacent thereto. The bracket portion is secured to one of the members. A lipped spring portion contains a lip surface, an enlarged width portion and a reduced width portion. The lipped spring portion is secured to the other member. The lip surface interlocks with the bracket portion end wall when the members are in a first predetermined position. When the members are moved from the first position to a second position, the reduced width portion and

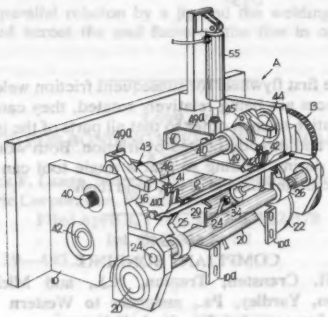
the enlarged width portion pass through the reduced width slot and the enlarged width slot, respectively, during the movement. The bracket and lipped spring portion may be formed integrally with the members.

3,699,633

MACHINE FOR MAKING HANGING FILE FOLDERS

Arthur H. Kidd, menomonee Falls, Wis., assignor to Condes Corporation, Milwaukee, Wis.

Filed Feb. 25, 1971, Ser. No. 118,691
Int. Cl. B23q 7/10
U.S. Cl. 29—211 D **13 Claims**



Apparatus for making hanging file folders of the type having a strip of metal along opposite sides and by means of which the folder can be hung on two parallel hangers. The apparatus includes means for transferring a V-shaped rod from a stack and to a swingable transfer arm, the swingable transfer arm then transferring the rod to the edge of the file blank for being clamped therealong. The apparatus also includes pressure pads for holding the stack of rods and releasing the lowermost rod at the appropriate time so that it can be picked up by the pick-up arms.

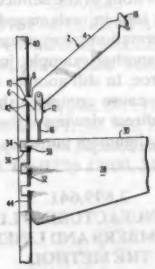
A machine for forming file folder blanks from a web, and automatically applying a rod on each of opposite sides of said blanks, said machine employing an apparatus of the above type at each side of the path of movement of said blanks.

3,699,634

SHELF BRACKET TOOL

Paul R. D'Amato, 1210 East Main Street, Waukesha, Wis.

Filed Feb. 22, 1971, Ser. No. 117,621
Int. Cl. B23p 19/04
U.S. Cl. 29—267 **2 Claims**



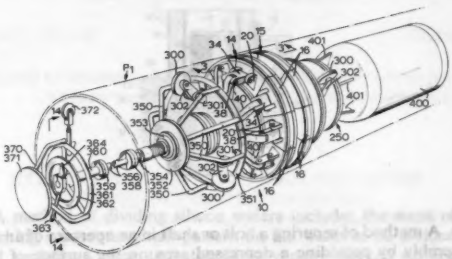
Shelf brackets typically have a series of downwardly hooked teeth which engage in slots in a supporting channel. The tool is a lever having at one end a dovetail for engaging into a channel slot above the bracket, near which dovetail is pivoted a dependant link engagable against a shelf bracket top for forcing the shelf teeth into the channel slots. At the other end of the lever is a projection engagable in a channel slot beneath the bracket, and a lever arm for engaging the bracket for prying the bracket teeth out of the channel slots.

3,699,635

INTERNAL LINE-UP CLAMP FOR PIPE LINES

Edmund G. Bradley, 7 Personna Boulevard, R.R. #2, Gormley, Ontario, and Reginald P. Whittingham, R.R. #2, Markham, Ontario, both of Canada

Filed May 26, 1970, Ser. No. 40,683
Int. Cl. B23p 19/04; B23q 3/18; B25b 1/18
U.S. Cl. 29—252 **12 Claims**



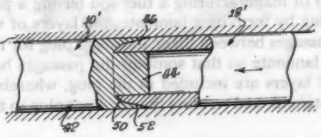
An internal line-up clamp which incorporates a pair of interconnected but independently operable clamping assemblies, each of which includes a set of radially movable pipe engaging shoes adapted to clampingly engage the inner circumferences of a pair of pipe sections in the zones adjacent their ends. At least two axially movable pneumatic actuators are operatively associated with each set of clamping shoes in a manner such that axial movement of the actuators effects radial movement of the shoe set with which they are associated. The clamping assemblies are interconnected by a plurality of axially extending rods which are adapted to maintain the assemblies in axial alignment while permitting them to be moved axially with respect to each other a limited distance. A fifth pneumatic actuator means is provided for effecting such reciprocal axial movement of the clamp assemblies.

3,699,636

METAL BONDING PROCESS

Gerard F. Walker, Hudson, Mass., assignor to Whittaker Corporation

Filed Feb. 17, 1971, Ser. No. 115,964
Int. Cl. B23p 11/00; B23k 21/00
U.S. Cl. 29—432 **7 Claims**



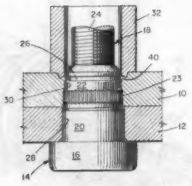
A method for pressure bonding metals of differing hardness to each other comprising mechanically forcing a shaped end of a harder metal member in tubular form into a flat-faced, chamfered end of a solid member of softer metal. The shaped end of the tubular member is formed by externally tapering one end of the tubular member to provide the latter with, preferably, two consecutive, intersecting tapered surfaces extending and tapering from the outer to the inner surface of the tubular member and defining an internally included angle of less than 180°. Each tapered surface is tapered between about 5° and about 45° with respect to the longitudinal axis of the tubular member. The chamfered end of the solid member is formed by tapering the side wall adjacent one end of the latter between about 5° and about 30° with respect to the longitudinal axis of the solid member. The internal diameter of the tubular member is less than the width of the chamfered end of the solid member.

3,699,637

METHOD OF LOCKING A BOLT IN AN ASSEMBLY BY EXTERNAL STAKING

Frank C. Rosiek, Royal Oak, Mich., assignor to The Budd Company, Philadelphia, Pa.

Filed Aug. 19, 1970, Ser. No. 65,068
Int. Cl. B23p *11/00*
U.S. Cl. 29—432.1 2 Claims



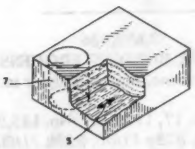
A method of securing a bolt or shaft in an aperture of an assembly by providing a depressed area on the surface of the bolt and flowing metal surrounding the aperture into the cavity of the depressed area by application of force to a staking tool to cause such metal flow.

3,699,638

METHOD OF FABRICATING A FUEL ROD HAVING A POROUS PLUG

Jean-Paul Laurent Van Dievoet, Bruxelles, Belgium, assignor to Societe Belge pour l'Industrie Nucleaire, S.A."-Belgonucleaire", Bruxelles, Belgium

Filed Nov. 24, 1969, Ser. No. 879,128
Claims priority, application Belgium, Nov. 29, 1968, 724.655
Int. Cl. B23p *3/00, 25/00*
U.S. Cl. 29—458 3 Claims



Method of manufacturing a fuel rod having a jacket and a porous plug by forming a laminate, the layers of which have porous passages between them, cutting a plug for the fuel rod from the laminate so that some of the passages between the laminated layers are included in the plug, whereby a porous plug is obtained, and welding the resultant plug to the fuel rod jacket.

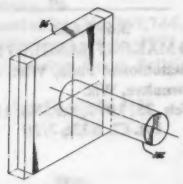
3,699,639

FRICTION WELDING METHODS

Edwin D. Ditto, Sandusky, Ohio, and William S. Stone, Trenton, Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 778,720, Nov. 25, 1968, Pat. No. 3,627,189. This application Oct. 27, 1970, Ser. No. 84,424
Int. Cl. B23k *27/00*
U.S. Cl. 29—470.3 11 Claims

Friction welder and friction welding methods in which plural flywheels can be selectively connected to a single workpiece drive spindle at different times so that kinetic energy can be stored in one flywheel as the kinetic energy of another flywheel is being used to relatively rotate and frictionally weld two workpieces engaged under thrust load. After the workpieces are welded, new workpieces are inserted into the welder so that the energy of the second flywheel can be utilized to relatively rotate and frictionally weld the other workpieces engaged under thrust load as kinetic energy is being stored in the first flywheel for subsequent friction welding. As the workpieces are being relatively rotated, they can be slid laterally relative to each other so that all parts of the interface are cleaned and directly heated by friction. Both workpieces are rotated during welding so that a single tool can be employed to facilitate removal of hot-weld flash.

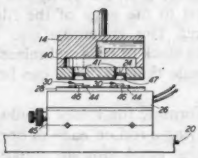


3,699,640

COMPLIANT BONDING

Benjamin H. Cranston, Trenton, N.J., and Michael P. Eleftherion, Yardley, Pa., assignors to Western Electric Company Incorporated, New York, N.Y.

Filed Dec. 1, 1970, Ser. No. 94,135
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.1 12 Claims



Compliant bonding of beam-leaded semiconductor devices is improved by deforming a compliant member into apertures of a rigid bonding grid during a bonding process. The deformation of the compliant member provides a desired clearance around brittle body portions of the semiconductor devices so that the body portions remain undamaged during bonding. In one example, the deformation takes place during exertion of bonding force and, in another example, just prior to the exertion of the bonding force. In still another example, the deformation is sufficient to cause complete shearing of the compliant member so that direct viewing of the device through the compliant member for alignment purposes can be effected.

3,699,641

METHOD FOR MANUFACTURING LINER BODY FOR COMBUSTION CHAMBERS AND LINER PRODUCED BY THE METHOD

Gottfried Kuhnen, Nussbaumen, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Continuation of Ser. No. 820,270, April 29, 1969, abandoned. This application July 23, 1971, Ser. No. 165,401
Claims priority, application Switzerland, April 30, 1968, 6451/68
Int. Cl. B23k *5/22*
U.S. Cl. 29—493 5 Claims

A liner body for combination chambers comprises a cover plate made entirely of welding material deposited across the

ends of and united with a plurality of parallel spaced cooling elements such as cooling fins. The cooling fins are held in

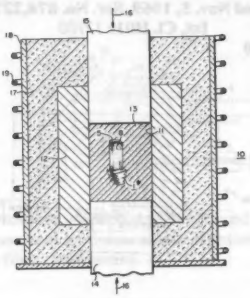
proper parallel relation by a jig and the welding material is deposited across the end faces of the fins in one or more layers.

3,699,642

METHOD FOR BONDING SHEET METAL CLADDING TO A BODY

Frederick F. Lange, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed April 8, 1971, Ser. No. 132,378
Int. Cl. B23s *31/02*
U.S. Cl. 29—497.5 **5 Claims**



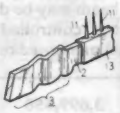
A method for applying a cladding to the surface of a body by enclosing the body with a cladding of sheet metal or foil loosely adherent to the body surface in a mass of a non-reactive, non-densifying powder, and compressing the powder at a pressure of greater than about 500 psi and at elevated temperatures up to the melting point of the body or the cladding.

3,699,643

METHOD FOR MANUFACTURING A GILL FALLER OF A CONSTANT THICKNESS FALLER BODY TYPE

Ichizo Isumi, A6-206, 212-2, Oaza Yamada Shimo, Suita-shi, Osaka, Japan

Division of Ser. No. 4,218, Jan. 20, 1970. This application March 8, 1971, Ser. No. 122,013
Claims priority, application Japan, Jan. 27, 1969, 44/7345
Int. Cl. B23p *17/00, 25/00*
U.S. Cl. 29—527.1 **4 Claims**



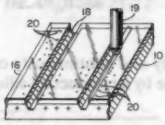
A method for manufacturing a gill faller of a constant thickness faller body type wherein a faller body is formed by an application of blanking to a plain steel plate of constant thickness, ends of the plain faller body are shaped as desired by pressing and combing pins are attached to thusly shaped faller body by plastic molding technique.

3,699,644

METHOD OF DIVIDING WAFERS

Frank J. Cocca, East Boston, Mass., assignor to Sylvania Electric Products Inc.

Filed Jan. 4, 1971, Ser. No. 103,583
Int. Cl. B23k *17/00*
U.S. Cl. 29—527.2 **2 Claims**



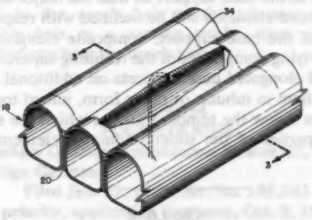
A method of dividing silicon wafers includes the steps of marking a predetermined pattern on the wafer to be divided and applying a clear dielectric film over the marked surface thereof. The surface of the wafer is cut through the dielectric film along the pattern with the resulting debris being scattered over the protective film. The protective film along with the debris is then removed, for example, by washing in an appropriate solvent. The wafer is then broken along the cut surface for further processing.

3,699,645

METHOD OF MAKING APPARATUS FOR SENSING TEMPERATURE

Ronald G. Huff, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Division of Ser. No. 877,717, Nov. 18, 1969, Pat. No. 3,671,329. This application May 26, 1971, Ser. No. 147,099
Int. Cl. B01j *17/00;* **H01l** *15/00;* **H01n** *49/00*
U.S. Cl. 29—573 **10 Claims**



Measuring the surface temperature of a wall heated by a flowing fluid without disturbing the boundary layer. A thin electrical conductor forming a thermocouple junction is covered by a layer of protective material to guide the flow of fluid over the junction.

3,699,646

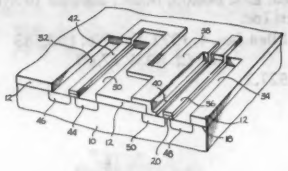
INTEGRATED CIRCUIT STRUCTURE AND METHOD FOR MAKING INTEGRATED CIRCUIT STRUCTURE

Leslie L. Vadasz, Sunnyvale, Calif., assignor to Intel Corporation, Mountain View, Calif.

Filed Dec. 28, 1970, Ser. No. 101,805
Int. Cl. B01j *17/00;* **H01j** *1/14, 5/02*
U.S. Cl. 29—571 **7 Claims**

In connection with the fabrication of an integrated circuit, a method for simultaneously completing the formation of a contact, an interconnect, a gate and a source or drain is disclosed. An integrated circuit field effect structure wherein a diffused

silicon area is connected directly to a polysilicon member by conductive silicon and more specifically the source or drain of



one device is directly and continuously connected to the gate of an adjacent device by a conductive silicon member.

3,699,647

METHOD OF MANUFACTURING LONG LENGTH COMPOSITE SUPERCONDUCTORS

Michel Bidault, Bougival; Jean Dosdat, Verrieres le Buisson; Roland Lelay, Morsang sur Orge, and Jean Claude Parouty, Houilles, all of France, assignors to Compagnie Francaise Thomson Houston-Hotchkiss Brandt, Paris, France

Filed July 15, 1970, Ser. No. 55,095

Claims priority, application France, July 18, 1969, 6924592

Int. Cl. H01v *11/00*

U.S. Cl. 29—599 **18 Claims**

Elongated elements of superconductive material are applied to an elongated, heated base support at a temperature permitting retention of the superconductive qualities in the material, and in a controlled atmosphere, the application step being carried out while twisting the superconductive element with respect to the base support so that the major axes of the superconductive elements will be inclined with respect to the major axis of the base support; composite elements can be made by applying composites of the resulting superconductive material and elongated base supports on additional supports, or forming them in tubular or other form, joined together, at temperatures below the temperatures at which the superconductive properties of the superconductive elements are affected.

3,699,648

MEMORY DEVICE AND METHOD OF MAKING THE SAME

Kiichi Sato, and Isamu Ogura, both of Tokyo, Japan, assignors to Oki Electric Industry Company Limited, Tokyo, Japan, by said Ogura

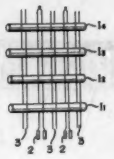
Division of Ser. No. 712,731, March 13, 1968, Pat. No. 3,611,326. This application July 31, 1970, Ser. No. 64,939

Claims priority, application Japan, March 15, 1967, 42/15788

Int. Cl. H01f *7/06*; G11c *5/06*

U.S. Cl. 29—604 **32 Claims**

A memory device includes at least one memory plane comprising a plurality of substantially parallel memory lines serving as digit lines and arranged in a common plane, and plural pairs of lead wires, serving as word lines, with one lead wire of each pair extending along only one surface of the plane and the other lead wire extending along only the opposite surface of the plane, whereby one lead wire of each pair overlies all the memory lines and the other lead wire of each pair underlies all the memory lines, with the lead wires intersecting the memory lines at right angles. Plural pairs of insulated strings extend in parallel relation between respective pairs of adjacent memory lines, with the strings of each pair extending al-



ternately above and below adjacent pairs of lead wires and crossing each other between such adjacent pairs of lead wires to clamp the same in position therebetween. Plural memory planes may be interconnected by the memory lines and the insulated strings, in the form of a ribbon cable. At least some of the memory lines have a surface plating of a magnetic alloy, and the lead wires are insulated wires or tapes.

3,699,649

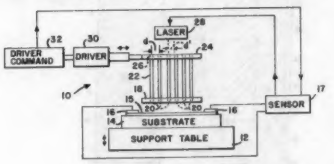
METHOD OF AND APPARATUS FOR REGULATING THE RESISTANCE OF FILM RESISTORS

Donald A. McWilliams, 1916 North Gilbert, Fullerton, Calif.

Filed Nov. 5, 1969, Ser. No. 874,227

Int. Cl. H01c *17/00*

U.S. Cl. 29—610 **18 Claims**



Method and apparatus for automatically trimming film resistors in production quantities. The method includes the steps of placing a substrate with a film resistance to be trimmed on a support beneath a grid mask of desired pattern; extending fiber optics from the grid mask to a fiber optic receiving support; directing a laser beam towards the receiving support; and moving the receiving support relative to the beam in a controlled manner. Apparatus may include a support table for supporting a substrate carrying a film to be trimmed in position to be in contact with a set of electrical probes connected with a sensor circuit for monitoring the actual resistance value of the film. Positioned above the film and substrate is a fixed aperture mask carrying the geometric requirements of the circuit with openings at required precision adjustment points. A fiber optic pipe joins each opening so as to focus light conducted by the fiber optic in the thin film plane of the resistor matrix. The fiber optic light pipes terminate in a common plane to receive a laser beam. The receiving end of the fiber optic light pipes and the laser beam are movable relative to one another so that the beam may be directed to select pipes. The relative movement is controlled dependent upon the desired pattern and actual monitored resistance value.

3,699,650

CO-FIRING PROCESS FOR MAKING A RESISTOR

Theodore F. Cocca, Everett, Mass., assignor to Spacetac Incorporated, Bedford, Mass.

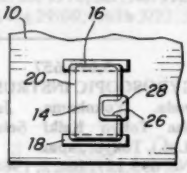
Filed Jan. 25, 1971, Ser. No. 109,337

Int. Cl. H01c *7/00*

U.S. Cl. 29—620 **1 Claim**

A resistor element and a process for manufacturing it including the steps of applying resistor material to a substrate;

baking and drying the resistor material at approximately 125° centigrade; applying a glass coating on the resistor material;



baking and drying the glass coating at approximately 125° centigrade; and co-firing the material at approximately 840° centigrade to form a resistor element.

3,699,651

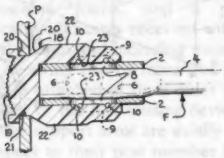
TERMINATION METHOD FOR OPTIC MEANS

Herman Rueger, Lancaster, and Joseph Richard Keller, Harrisburg, both of Pa., assignors to AMP Domestic Inc.

Division of Ser. No. 557,797, June 15, 1966, Pat. No. 3,517,981. This application April 9, 1970, Ser. No. 27,015

Int. Cl. H01r *9/00*

U.S. Cl. 29—630 A **2 Claims**



A terminal member is adapted to be secured onto the end of a fiber optic means at a minimum loss of transmission characteristics of the fiber optic means.

ERRATUM

For Class 29—159 R see:
Patent No. 3,700,382

3,699,652

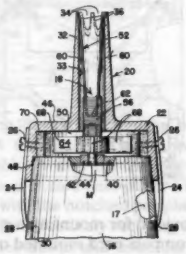
ROTARY HAIR CLIPPER

Kenneth D. Deverman, 333 Old Mill Road, and Charles R. Struck, 125 Arboleda Road, both of Santa Barbara, Calif.

Filed Nov. 9, 1971, Ser. No. 197,093

Int. Cl. B26b *19/18, 19/44*

U.S. Cl. 30—29.5 **5 Claims**



A rotary motor driven hair clipper for removing unwanted hair from the nostrils or ears and embodying a tubular shearing head within which a plurality of cooperating orbiting shearing blades function in close-fitting relationship under the influence of centrifugal force. A radial type fan which rotates with the shearing blades creates a suction which draws the sheared hair residue through the tubular shearing head and deposits the same on the inner surface of a removable filter ring.

3,699,653

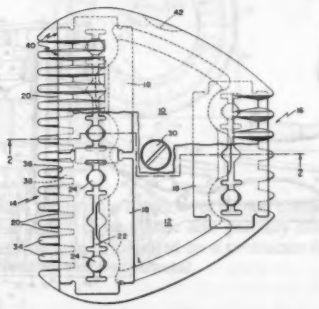
HAIR TRIMMER

Oscar Miller, 4 Overlook Park, Newton Center, Mass.

Filed May 18, 1970, Ser. No. 38,412

Int. Cl. B26b *21/12*

U.S. Cl. 30—30 **1 Claim**



This disclosure includes a combination comb and hair trimmer which receives replaceable razor blades. The cutting edge of the trimmer includes a number of teeth defining a comb with the teeth projecting forwardly beyond the transverse cutting edge of the razor blade. The teeth are effective to comb the hair just prior to cutting and also to provide a safety guard for the sharp razor edge. The trimmer is formed from two generally flat and separable parts, each part having a portion of the teeth formed integrally therewith so that when the parts are mated they will define the full teeth of the comb. Each of the parts also include means for supporting the razor blade firmly in position in relation to the comb. The tooth portions in each of the parts are made so that no crevices are presented to the user's hair as the trimmer is advanced through his hair in a cutting stroke, thus avoiding the likelihood of catching the user's hair.

3,699,654

POCKETKNIFE

Ernst Joachim Gerling, Brosshausen Strasse 27, 3650 Solingen-Ohligs, Germany

Filed Jan. 12, 1971, Ser. No. 105,863

Claims priority, application Germany, Oct. 9, 1970, P 20 51 431.2

Int. Cl. B26b *1/02*

U.S. Cl. 30—155 **5 Claims**

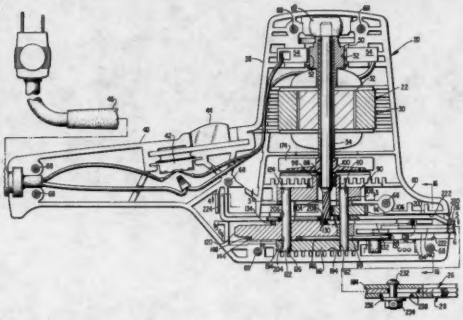
A pocketknife having a handle or a haft and a knife blade which can be folded and unfolded from the handle. The handle is formed out of sheet material which is bent to receive the knife blade between two sides when the blade is folded. A por-

tion of the sheet material forms a spring which engages the knife blade to hold the blade in a fully unfolded or folded position as desired.

3,699,655
POWER DRIVEN HAND TOOL

Robert W. Taylor, Jackson, and Jerry W. Sellers, Lexington, both of Tenn., assignors to Rockwell Manufacturing Co., Pittsburgh, Pa.

Filed Jan. 18, 1971, Ser. No. 107,355
Int. Cl. B26b *19/02*
U.S. Cl. 30—216 **12 Claims**

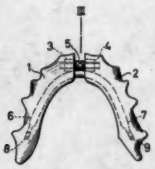


A power driven hedge trimmer having a substantially mirror image pair of cooperating, relatively reciprocable cutter blades and being operatively interchangeable one with the other for use as either the top blade or the bottom blade in a dual cutter blade assembly. The dual cutter blade assembly is supported from a support bar having one end received in a split clam shell housing. The support bar overlies the cutter blade assembly and is supported by the housing by being separably trapped at its one end between the halves of the clam shell housing. Another feature disclosed herein pertains to a pair of axially spaced bearing plates for journalling a motor armature shaft and gear-mounting shafts. The bearing plates are trapped in position between the halves of the split clam shell housing and are constructed in such a manner that forces tending to turn or twist the bearing plates will be about an axis aligning with the rotational axis of the armature shaft.

3,699,656
TEETH REGULATING DEVICE HAVING A U-SHAPED RIGID BRACKET ANCHORED IN THE POSTERIOR PORTIONS OF A PLATE

Rudolf Scheu, 20, Am Burgberg, Letmathe, Germany

Filed July 22, 1969, Ser. No. 846,652
Claims priority, application Germany, Dec. 2, 1965, Sch 38 110
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 E **18 Claims**

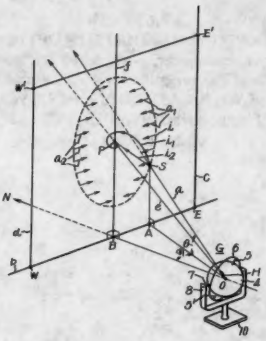


A teeth adjusting device comprising a split expanding plate comprised of two plate parts conforming in shape to a set of teeth, the plate parts being joined together at their anterior ends by adjustable means permitting expansion and contraction. The plate parts are slidably supported against torsion or tilting on a rigid U-shaped bracket having its ends pivotally anchored in the posterior ends of the respective plate parts. The anchored ends may be preformed pins inserted in ends of the U-shaped part of the bracket, and the pins may have enlarged ends.

3,699,657
GYROSCOPIC INSTRUMENT

Shin-ichi Kawada, Yokohama, Japan, assignor to Kabushikikaisha Tokyo Keiki Seizosho (Tokyo Keiki Seizosho Co., Ltd.), Tokyo, Japan

Division of Ser. No. 695,127, Jan. 2, 1968, Pat. No. 3,596,366.
This application Aug. 3, 1970, Ser. No. 60,282
Claims priority, application Japan, Jan. 13, 1967, 42/2649
Int. Cl. G01c *19/40*
U.S. Cl. 33—324 **4 Claims**

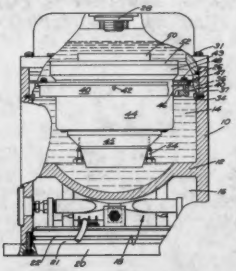


A gyroscopic instrument having a gyro case including a gyro therein and supported with three degrees of freedom and means for applying a control torque to the gyro about a substantially horizontal axis across the gyro-spin axis at right angles thereto in response to a differentiated value of the inclination of the gyro-spin axis.

3,699,658
BINNACLE

Harold S. Burns, Falmouth, Mass., assignor to Electro Marine Corp.

Filed Oct. 30, 1970, Ser. No. 85,357
Int. Cl. G01c *17/08*
U.S. Cl. 33—346 **1 Claim**

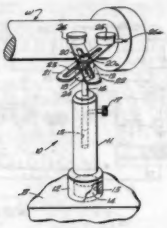


A binnacle is provided for mounting a compass which compass consists of a compass card mounted on a jeweled bearing and within a compass liquid in a first container, which in turn is gimballed in two directions (orthogonally) into the binnacle housing. The binnacle housing for the gimbal rings and the entire gimbal pivot as well as the compass housing is immersed in a compartment filled with a second fluid to provide damping for the compass bowl and the gimbal assembly.

3,699,659
MULTI-INDICATOR SETUP GAUGE

Erhart P. Roeller, 154 Scoles Avenue, Clifton, N.J.

Filed Dec. 18, 1970, Ser. No. 99,592
Int. Cl. A47g *29/00*; G01b *3/22*, *5/20*
U.S. Cl. 33—172 R 1 Claim

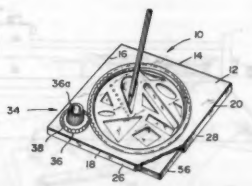


A multi-indicator setup gauge device is described for simultaneously taking two or more indications or measurements during setup or machining operations of a rotary workpiece is described, comprising a vertical support column having magnetic means at its lower end for selective attachment to a metal-working machine frame, and a post member telescopingly vertically adjustably received within the upper end of the support column and including means at its outer end for adjustably securing two or more dial gauge support arms adapted to have attached at their outer ends rotatably adjustable dial gauges or the like sensing devices. The inner ends of the dial gauge support arms are axially and rotatively adjustable with respect to their post member to provide for universal adjustable positioning of the dial gauges in a lateral plane.

3,699,660
DRAWING DEVICE

Herman M. Siegel, Stamford, Conn., assignor to E. S. Lowe Company, Inc., Long Island City, N.Y.

Filed April 2, 1971, Ser. No. 130,676
Int. Cl. B44d *3/30*
U.S. Cl. 33—174 B 6 Claims

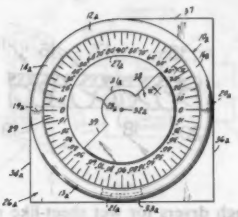


A child's drawing device including a base plate having a central opening. A template having a notched periphery is located and rotatable in said central opening and a gear is received in a gear seat in said base plate. The teeth of the gear are in engagement with the notched periphery of the template. Means is provided for selectively securing said gear in any one of a plurality of orientations and since the gear and template rotate with each other for securing said template in any one of a plurality of orientations. The base plate includes a number of edges and flanges depend from each of said edges in the same direction perpendicularly away from said base plate. During use a pad may be held fixed relative to said base plate and template by being nested within said flanges.

3,699,661
LIQUID LEVEL DEVICE

George W. Baltz, Route 4, Pocahontas, Ark.

Continuation-in-part of Ser. No. 877,404, Nov. 17, 1969. This application July 13, 1970, Ser. No. 54,314
Int. Cl. G01c *9/20*
U.S. Cl. 33—377 3 Claims

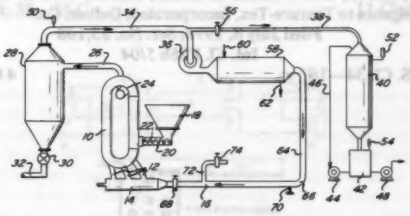


The disclosure includes a liquid level device comprising a circular tube made of clear plastic and partially filled with colored water. The tube is mounted on a protractor for measuring angles relative to the horizontal.

3,699,662
DRYING PROCESS FOR PULVERULENT MATERIAL

Nicholas N. Stephanoff, Haverford, Pa., assignor to Fluid Energy Processing & Equipment Company, Hatfield, Pa.

Continuation of Ser. No. 748,515, July 29, 1968, abandoned. This application June 18, 1970, Ser. No. 47,232
Int. Cl. F26b *3/10*
U.S. Cl. 34—10 4 Claims

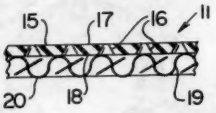


A process for drying wet pulverulent material by utilizing, as the heat-producing medium, the vapor form of the wetting liquid itself at a temperature higher than the deterioration temperature of the material being dried. The system comprises a continuous process whereby the pulverulent material is fluidized and dispersed while being centrifugally propelled through an arcuate mill. The fluidization and dispersion of the particles provides maximum surface exposure thereof to the heat of the liquid vapor. This results in an almost instantaneous flash-drying effect which is endothermic in nature. This endothermic reaction almost instantly lowers the temperature below the deterioration point of the material being dried. In this manner, very high temperatures can be used for rapid drying even though such temperatures may be above the deterioration temperature of the material being dried, while the vapor form of the liquid contaminate, itself, is used both as the source of drying heat and as the motive force.

3,699,663
METHOD AND APPARATUS FOR TREATING SHEET-LIKE MATERIAL WITH FLUID

Robert R. Candor, 5940 Munger Road, Dayton, Ohio, and James T. Candor, 5440 Cynthia Lane, Dayton, Ohio

Filed Jan. 12, 1971, Ser. No. 105,894
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 20 Claims

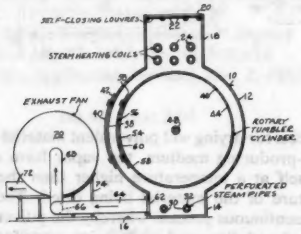


In air-through dryers for wet sheet-like material, such as paper, textiles, etc., the moist sheet-like material is subjected to an air pressure differential across the same so that heated or unheated air is caused to be engaged against one side of the sheet-like material and pass therethrough to the other side thereof to remove moisture from such sheet-like material as the air passes therethrough, such moisture being removed by a pushing out of the moisture by the air and/or by air entrainment. A belt means of this invention comprising a perforated flexible wall carrying felt fabric or other similar material on one side thereof is utilized in a manner to engage against the moist sheet-like material to compress the same during the passage of air through the perforated flexible wall and through the moist sheet-like material to assist in the water removal thereof by tending to cause the retained moisture of the sheet-like material to continuously fill the voids thereof and be more readily swept away by the air flow than when no compressing of the moist sheet-like material takes place.

3,699,664
PROCESS FOR IMPROVING THE BULK AND RESILIENCY OF YARNS

Leslie E. Lunsford, Chattanooga, Tenn.; Clyde A. Simmons, Calhoun, and William L. Evans, Dalton, both of Ga., assignors to Texture-Tex, Incorporated, Dalton, Ga.

Filed July 8, 1970, Ser. No. 53,108
Int. Cl. F26b *5/04*
U.S. Cl. 34—16 4 Claims

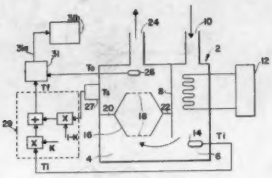


Yarn in skein form is introduced into a tumbler and subjected to the action of steam to increase the bulk of the yarn and render the bulk more uniform from end to end, and at the end of the steaming cycle valves are closed and exhaust fans are activated to remove steam from the chamber. The yarn is then subjected to air currents and dry heat to dry and further develop bulk in the yarn, after which the yarn is preferably subjected to further steam and heat setting steps.

3,699,665
BATCH DRYER CONTROL APPARATUS

Francis G. Shinskey, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Dec. 29, 1970, Ser. No. 102,469
Int. Cl. F26b *19/00*
U.S. Cl. 34—48 6 Claims

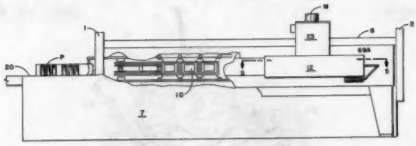


Method and apparatus for controlling the moisture content of a product dried in a batch dryer system wherein the length of the batch drying cycle necessary to result in a predetermined moisture content of the material to be dried is determined by reference to three characteristic temperatures of the process, the temperature of the inlet air, the temperature of the exhaust air and the equilibrium temperature during constant rate evaporation of the solid. The first and third temperature are determined and used to calculate the final value required of the second temperature in order to achieve the proper moisture content of the material. The second temperature is then monitored and the drying cycle is terminated when the final value is reached.

3,699,666
FILM HEATING SYSTEM

Rodney K. Calvert, Dunwoody, and Charles Rabun Landrum, Smyrna, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed April 8, 1971, Ser. No. 132,328
Int. Cl. F26b *21/00*
U.S. Cl. 34—54 6 Claims

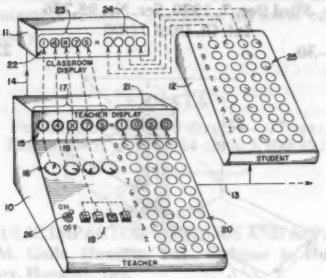


A mechanism includes a series of half-shells pivotally interconnected to form an endless chain of elements and forms a series of half-sections from a film drawn by vacuum into the pivotally interconnected half-shells and such half-sections are secured to another series of similarly formed half-sections to envelop a plurality of primary packages. The pairs of half-sections are then sealed together and tightened about the primary packages and are subsequently severed from each other. In order to condition the film for lining the half-sections, it is necessary to apply heat thereto and such heating is effected by supplying fluid such as heated air at a constant temperature and a at a rate which varies in accordance with variations in the velocity of movement of the film through the heating station, such movement being a function of the speed of operation of the mechanism itself.

3,699,667
ARITHMETIC TEACHING APPARATUS

Peter Devera Gomez, 2036 South "K" Street, Oxnard, Calif.

Filed April 12, 1971, Ser. No. 133,270
Int. Cl. G09b
U.S. Cl. 35—9 B 7 Claims

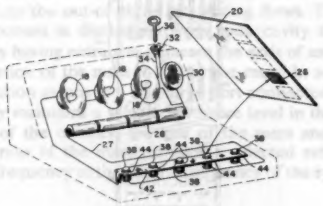


A teacher's unit includes means for displaying numerals defining a selected problem by the teacher. Simultaneously, the numerals defining the problem are displayed on a classroom display unit. The teacher can then display the correct answer on his own display unit but such answer will not appear on the classroom display unit. Each of the students is provided with a student's unit connected to the classroom display means such that the student can attempt to display numerals defining the answer to the problem on the classroom display means. The student is only successful if he selects the correct answer corresponding to the answer set up by the teacher on the teacher's display unit.

3,699,668
INSTRUCTIONAL DEVICE WITH INTERCHANGEABLE INDICIA CARDS

Ian A. Tesar, 53 River Road, Cos Cob, Conn.

Filed Feb. 19, 1971, Ser. No. 116,771
Int. Cl. G09b 7/06
U.S. Cl. 35—9 D 10 Claims

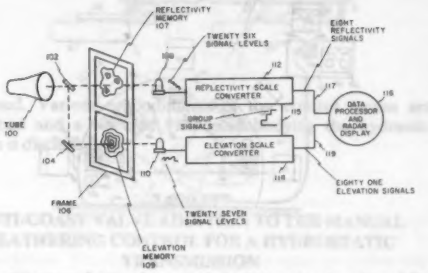


An instructional device or educational toy having a series of question and answer cards that are interchangeable on a portable console having spaced push buttons that selectively actuate an electrical signal system. The cards have a metallic tape or a metallic imprint on the rear, hidden side of the card directly under a corresponding correct push button whereby, when the correct push button is pushed, the signal system is made operative.

3,699,669
RADAR LANDMASS SIMULATOR

Hans H. Wolff, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 14, 1971, Ser. No. 152,846
Int. Cl. G01s 9/00
U.S. Cl. 35—10.4 4 Claims

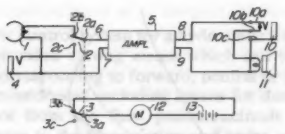


In a radar landmass simulator having one photographic memory for storing elevation information and another photographic memory for storing reflectivity information, surplus reflectivity storage is used to store multiplying factors for expanding the elevation information. The multiplying factors are combined with the elevation information to extend the range of usable elevations. Since a surplus of reflectivity storage is available, the net effect is to increase the available elevation storage by a factor of three or more with no increase in the size of the memories.

3,699,670
REPRODUCING DEVICE

Yukio Takeda, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sept. 28, 1970, Ser. No. 76,161
Claims priority, application Japan, Oct. 2, 1969, 44/79395; Oct. 8, 1969, 44/80945; Oct. 11, 1969, 44/81347; Oct. 15, 1969, 44/82834; Oct. 11, 1969, 44/81348
Int. Cl. G09b 5/04; G11b 15/18, 19/20
U.S. Cl. 35—35 C 11 Claims

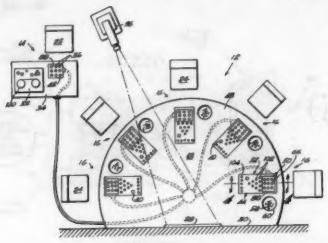


In a record player, magnetic reproducing apparatus, magnetic recording and reproducing apparatus, etc. used for reproducing a sound recorded on a disc record or tape record; the reproducing device comprising a stop motion for temporarily stopping automatically or manually the movement of said recording medium in relation to a converter element, a means interlocked with said stop motion for switching the input of an amplifier between a converter element such as a pick-up cartridge or a magnetic head and a microphone, and a releasing means for de-energizing said stop motion, a teacher's model speech or pronunciation being reproduced by the relative movement of said recording medium and converter element in a reproducing operation, said reproducing operation then being temporarily stopped, which connects a microphone with the amplifier and enables a learner to hear his own speech or pronunciation through headphone, earphone or a speaker, the temporary stoppage of reproduction being released on completion of said hearing of the learner's own voice, thereby to reproduce a teacher's model again.

3,699,671
EDUCATIONAL GAME APPARATUS

Donald James Desmond, 620 Highland Avenue, Woodstock, Ill.

Filed Sept. 9, 1970, Ser. No. 70,234
Int. Cl. G09b 7/06
U.S. Cl. 35—48 R 8 Claims

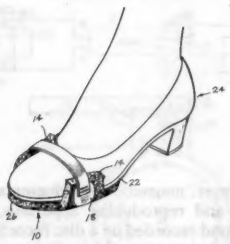


Educational apparatus of the question and answer type including a teacher station and a plurality of student stations with the switch means of the student and teacher stations being correspondingly identified by numbers, letters or other symbols. A teacher-student circuit connects like-identified switch means of the teacher station with the switch means of each student station. Each circuit provides means for indicating the correct answer of a multiple choice question, the answer to a mathematical problem or the like: The teacher closes a switch of a circuit representing the right answer to a question and a student, knowing the answer to the question, closes a switch of the same circuit, completing the circuit and emitting a signal indicating a correct answer is given. The apparatus also includes tally means for monitoring the performance of the individual students.

3,699,672
FLOOR CLEANING DEVICE ADAPTED FOR SECUREMENT TO A SHOE

Clarence R. Sims, Route 6, P.O. Box 121, Elkhart, Ind.

Filed Sept. 4, 1970, Ser. No. 69,740
Int. Cl. A43b 3/18
U.S. Cl. 36—7.7 12 Claims



A device which may be used for cleaning floors, household appliances, and similar items and which includes an elongated flexible pad of abrasive material adapted to be positioned across the sole of a shoe or the inside surface of the fingers of the hand with the end portions of the pad lapping the opposite side edges of the shoe sole or fingers. A strap having the ends thereof secured to the end portions of the pad is included and is adapted to extend across the upper part of the shoe or the back surface of the fingers so as to hold the pad against the shoe sole or inside surface of the fingers. A pad gripping part is carried at one end of the strap and is releasably interlocked with its engaged pad end portion at a selected location thereon.

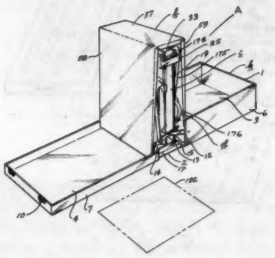
ERRATUM

For Class 37—8 see:
Patent No. 3,700,383

3,699,673
IRONING APPARATUS

Edwin E. Foster; Wilbur A. Foster, and Thomas E. Foster, all of Austin, Tex., assignors to Majik-Ironers, Inc., Austin, Tex.

Filed Dec. 7, 1970, Ser. No. 95,736
Int. Cl. D06f 71/00
U.S. Cl. 38—30 22 Claims

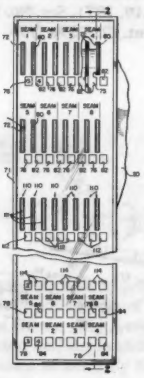


An ironing apparatus which compactly and unitarily comprises an iron, an ironing board, support structures for said iron and said ironing board, a casing of relatively small volume for containing the same with frame means fixing said casing to said support structures whereby said apparatus is adapted for operative disposition when said casing is opened to provide a base with said ironing board being in extended condition and said iron disposed thereabove, and inoperative position wherein said apparatus components are fully received within the closed casing for ready transportability.

3,699,674
SEAM LOCATOR FOR SIZING DRAPERIES

Howard D. Reed, 4310 Sunrise Road, Indianapolis, Ind.

Filed May 26, 1971, Ser. No. 146,912
Int. Cl. D06c 3/08
U.S. Cl. 38—102.5 13 Claims



A drapery sizer and a seam and return or overlap registering system. The drapery sizer includes upper and lower frames carrying upper and lower fingers proportioned and designed to receive therebetween portions, respectively, of the upper and the lower edges of a drapery. The upper fingers define pleat receiving spacers therebetween and the lower fingers are proportioned and designed to engage therebetween lengths of the lower edge portion corresponding respectively to the

pleats. Indicia means are placed on the lower fingers to identify positions thereon corresponding respectively to predetermined positions on the pleats. The registering system includes first means for registering the identity of each pleat in which each vertical seam of the drapery appears, second means for registering the position at which such a seam appears in such a pleat, and third means for registering the depth of the return or overlap at the upper edge portion of the drapery together with cooperating control means for determining and registering the amount of return or overlap at the lower edge portion of the drapery.

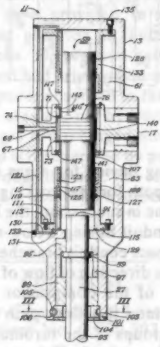
ERRATA

For Classes 46—136 thru 57—77 see:
Patents Nos. 3,700,384 thru 3,700,391

3,699,675
HYDRAULIC IMPACTOR METHODS AND APPARATUS

Edward M. Galle, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed April 5, 1971, Ser. No. 131,123
Int. Cl. F15b *15/18*
U.S. Cl. 60—52 HF **25 Claims**



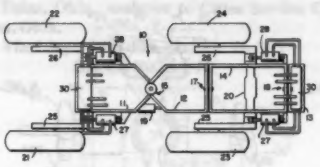
Methods and apparatus for generating two separated fluid flows that each include direct flow components as well as alternating, out-of-phase flow components, such separated flows being transmitted into two separate cavities that have interposed between them a mass capable of periodic movement responsive to the out-of-phase alternating flows. The direct flow component is discharged from each cavity through a passageway having entrances adjacent the ends of an enlarged central portion of the mass to center the mass. In addition, a flow restriction means in a discharge port connected with the passageway maintains a selected pressure level in the system. The sizes of the cavities, the size of the mass and the differential areas of the mass produce a selected ratio of the operating frequency to the natural frequency of the system.

3,699,676
HYDRAULIC SYSTEM

Eugene F. Beck, 29800 Seaview Road, Cazadero, Calif.

Continuation-in-part of Ser. No. 37,702, May 15, 1970. This application Sept. 8, 1971, Ser. No. 178,738
Int. Cl. F15b *11/22*
U.S. Cl. 60—52 S **13 Claims**

A hydraulic system comprising a pair of hydraulic motors or rams mechanically and hydraulically connected in opposition to each other and control means for simultaneously operating the rams either in tandem or in opposite sense to each other is

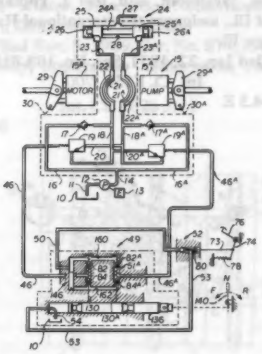


disclosed. Various embodiments of the control means are described and a wheeled vehicle embodying the hydraulic system is disclosed.

3,699,677
ANTI-COAST VALVE ADDITION TO THE MANUAL FEATHERING CONTROL FOR A HYDROSTATIC TRANSMISSION

Rodger W. Asmus, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 14,750, Feb. 24, 1970, abandoned, which is a continuation of Ser. No. 731,589, May 23, 1968, abandoned. This application Nov. 2, 1970, Ser. No. 86,365
Int. Cl. F16d *31/02*
U.S. Cl. 60—53 R **23 Claims**



A hydraulic control system for a hydrostatic transmission in which are provided valving means which can be selectively positioned corresponding to forward, neutral or reverse drive of the transmission and including means for dumping excess fluid pressure from the fluid pressure circuit in order to prevent damage to the transmission and under certain conditions to prevent overspeeding of the transmission to further prevent damage. Means are provided whereby fluid flow in the hydrostatic loop can be bypassed from its normal drive path in the transmission, through the valve means provided.

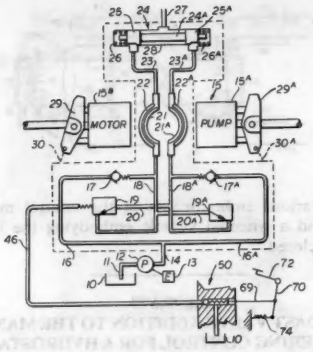
3,699,678
MANUAL DISCONNECT AND FEATHERING CONTROL FOR A HYDROSTATIC TRANSMISSION

William C. Swanson, Clarendon Hills; Donald W. Moyer, and Rodger W. Asmus, both of Downers Grove, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 11,930, Feb. 19, 1970, abandoned, which is a continuation of Ser. No. 731,473, May 23, 1968, abandoned. This application Nov. 5, 1970, Ser. No. 87,327
Int. Cl. F16h *39/10*
U.S. Cl. 60—53 R **10 Claims**

A hydraulic control system for a hydrostatic transmission in which a manual disconnect and feathering valve means are provided in conjunction with high pressure relief valve means to disrupt power flow through the transmission to be used

under emergency conditions, for clutching and feathering the transmission during other conditions. The means provided



make it possible to shunt fluid pressure from its normal path of flow in the hydrostatic loop so that drive is disengaged in whole or in part.

3,699,679

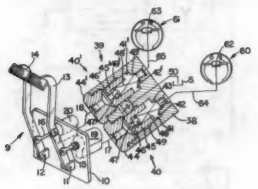
HYDRAULIC BRAKE ADJUSTOR AND EQUALIZER

John J. Bardos, Westmont, and Joel J. Poplawski, Hickory Hills, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 22, 1971, Ser. No. 108,818

Int. Cl. F15b 7/00

U.S. Cl. 60—54.5 E **9 Claims**



A valve assembly adapted to be interconnected between a pair of master cylinders and a pair of brake units for selectively permitting independent actuation of either of said brake units or simultaneous actuation thereof and having means for automatically adjusting the brake units.

3,699,680

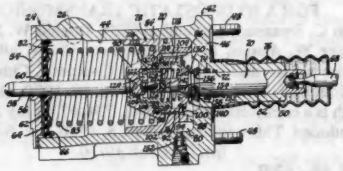
HYDRAULIC POWER BRAKE BOOSTER AND OPEN CENTER CONTROL VALVE THEREFOR

Ronald L. Shellhause, 519 Bennert Drive, Vandalia, Ohio

Filed Sept. 29, 1970, Ser. No. 76,473

Int. Cl. F15b 7/00, 11/08

U.S. Cl. 60—54.6 P **1 Claim**



A hydraulic power brake booster powered by power steering gear pump pressure and utilizing an open-center valve so that fluid flows through the booster without pressure reduction when the booster is not activated. The valve assembly includes a radially floating valve seat which provides for self-centering, permits a valve separation operation to pass viscous cold hydraulic fluid or any elements which may tend to overly restrict the valve. It also includes a valve face design providing entrance and exit angles defining a venturi-type passage conducive to laminar flow with consequent reduction in valve noise, and has a hydraulic reaction mechanism which includes an arrangement for supported line pressure.

3,699,681

LOAD CONTROL FOR GAS TURBINE PLANT

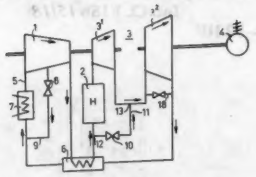
Hans Ulrich Frutschi, Zurich, Switzerland, assignor to Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft, Zurich, Switzerland

Filed July 6, 1971, Ser. No. 159,650

Claims priority, application Switzerland, July 9, 1970, 10389/70; Germany, July 17, 1970, P 20 36 381.9

Int. Cl. F01k 3/18

U.S. Cl. 60—59 T **7 Claims**



In a load regulating device for a gas turbine plant, which comprises in a flow-path for the working medium a compressor, heater and turbine in succession, the improvement, that at least one by-pass conduit having a flow-regulating element is provided, which by-pass conduit branches off the flow path at a point situated in the direction of flow of the working medium after a stage group of the compressor and in front of the heater, and opens into the flow path at a point situated between two stage groups of the turbine; this load-regulating device allowing good part-load efficiency.

3,699,682

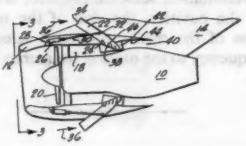
TURBOFAN ENGINE THRUST REVERSER

Harold F. Kleckner, Los Angeles, Calif., assignor to McDonnell Douglas Coporation

Filed Jan. 4, 1971, Ser. No. 103,577

Int. Cl. F02k 3/02

U.S. Cl. 60—226 A **7 Claims**



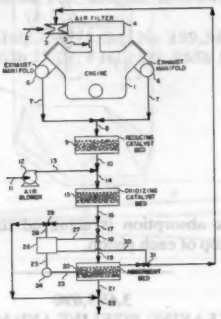
A turbofan engine thrust reverser comprising a plurality of pivotally mounted duct members forming an integral part of the engine cowl. These members redirect the exhaust air of the fan forward and outward at such velocity and angle that the suction of the engine inlet is insufficient to cause reingestion.

3,699,683

ENGINE EXHAUST EMISSION CONTROL SYSTEM

John F. Tourtellotte, Westfield; John S. Negra, Plainfield; Abe Warshaw, Matawan, and John F. Villiers-Fisher, Kendall Park, all of N.J., assignors to Chemical Construction Corporation, New York, N.Y.

Filed April 5, 1971, Ser. No. 131,279
Int. Cl. F01n *3/14, 3/16*; F02b *75/10*
U.S. Cl. 60—274 11 Claims



A system for the prevention of hydrocarbon emissions from engines during start up is provided, in which a cold engine generates an exhaust gas rich in unburned or thermally degraded hydrocarbons. The exhaust gas is passed through a hydrocarbon absorbent bed prior to atmospheric discharge, so that hydrocarbon vapor is absorbed in the bed. When the engine and exhaust gas are hot, and hydrocarbon emission low, most of the exhaust gas is discharged directly to atmosphere and the absorbent bed is regenerated by passing a small stream of hot exhaust gas through the bed. The resulting gaseous mixture of exhaust gas plug desorbed hydrocarbon vapor is recycled to the engine.

ERRATUM

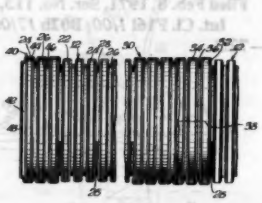
For Class 60—214 see:
Patent No. 3,700,393

3,699,684

CORRUGATED DRAINAGE TUBES AND FITTINGS

Marty E. Sixt, Iowa City, Iowa, assignor to Advanced Drainage Systems, Inc., Waterville, Ohio

Continuation of Ser. No. 819,339, April 25, 1969, Continuation of Ser. No. 663,051, Aug. 24, 1967. This application June 30, 1970, Ser. No. 56,098
Int. Cl. E02b *13/00*; F16l *11/04*
U.S. Cl. 61—11 13 Claims



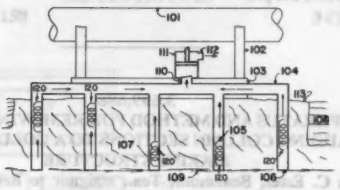
Flexible corrugated drainage tubes having alternating annular peaks and valleys and a plurality of slotted openings arranged transversely to the the longitudinal axis of the tubes. The fittings include flexible couplings for connecting the ends of corrugated tubes together and end plugs for capping the ends of tubes.

3,699,685

PERMAFROST STABILIZATION FOR BEARING HEAVY STRUCTURES

J. O. Scott, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed Sept. 30, 1970, Ser. No. 76,802
Int. Cl. E02d *3/10*
U.S. Cl. 61—36 A 10 Claims



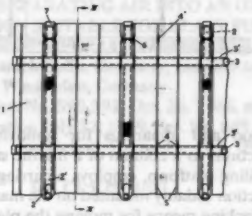
A process and apparatus are disclosed for improving load bearing capability of permafrost for mounting structures in arctic regions. The structures are loaded upon or within the permafrosted soil with means for melting the permafrost and means for removing water beneath the structures so that water accumulated from the melted permafrost may be drawn from below the structure and removed to the surface.

3,699,686

BOTTOM AND BANK FACING MATTRESS

Jan Gerrit De Winter, Enschede, Netherlands, assignor to Nicolon N.V., Enschede, Netherlands

Filed Nov. 5, 1969, Ser. No. 874,318
Claims priority, application Netherlands, Nov. 12, 1968, 6816093
Int. Cl. E02b *3/12*
U.S. Cl. 61—38 9 Claims



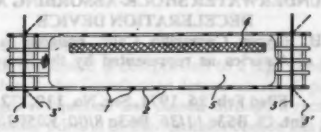
A mattress for use in building bottom and bank revetments consists of a woven mat of plastics material to which tubular structures of plastics material are secured as substitutes for conventional fascines, said tubular structures being adapted to be filled with ballast material.

3,699,687

ARRANGEMENTS FOR ANCHORING SUPPORTING PINS OR BOLTS

Andre Bourland, Dijon, France, assignor to Societe Anonyme D'Explosifs Industriels-Celtite

Filed Feb. 5, 1970, Ser. No. 8,914
Claims priority, application France, Feb. 2, 1969, 6903015; Nov. 27, 1969, 6940901
Int. Cl. E21d *20/02*
U.S. Cl. 61—45 B 9 Claims



A device is provided for use in anchoring a support pin in a hole adapted to accommodate the same. The device com-

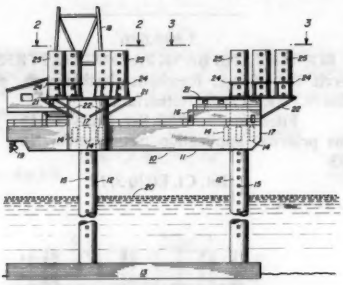
prises a hollow elongated element of open work construction and made of a friable material. This element contains a charge which is adapted to protrude through the open work construction when subjected to the pressure of a pin inserted in the aforesaid hole whereafter the friable material of the open work construction fragments during further insertion of the pin and becomes homogeneously distributed into the charge. A device is provided to brace the element in the hole adapted to receive the pin.

3,699,688

APPARATUS AND METHOD FOR REMOVING AND/OR ADDING COLUMN SECTIONS TO A COLUMN OF A MARINE STRUCTURE

John C. Estes, Beaumont, Tex., assignor to Bethlehem Steel Corporation

Filed Nov. 25, 1970, Ser. No. 93,301
Int. Cl. E02b *17/00*; B23p *19/00*
U.S. Cl. 61—46.5 **15 Claims**



A method and apparatus for removing and/or adding column sections to a column of a marine structure, such as a mobile drilling platform, employs a carriage for supporting a column section slidably mounted on the marine structure platform and jacking means for moving the platform and column relative to each other. When a column section is to be added to the column, the carriage with a column section supported thereon is positioned above the column. The jacking means is then operated to bring the top of the column into contact with the bottom of the carriage supported column section. The column section is then welded to the column and detached from the carriage. When a column section is to be removed from the column, a carriage is positioned above the column. The jacking means is then operated to bring the column within the carriage, and the column is secured to the carriage. A portion of the column is then severed from the column.

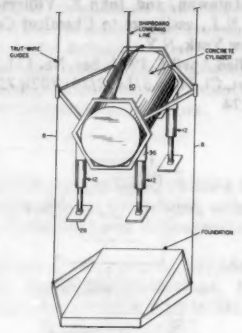
3,699,689

UNDERWATER SHOCK-ABSORBING AND DECELERATION DEVICE

Harvey H. Haynes, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 26, 1971, Ser. No. 119,272
Int. Cl. B63c *11/36*; B63q *8/00*; E05f *3/04*
U.S. Cl. 61—69 **5 Claims**

A device for cushioning the landing impact shock of a heavy underwater object during installation on the ocean bottom. It employs a set of telescoping leg assemblies each having an air entrapping cylinder and a dash-pot like piston moveable



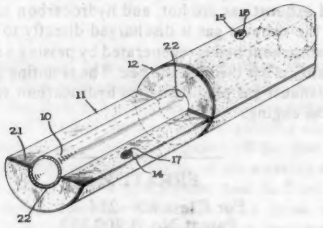
therein. Shock absorption is achieved through air pockets formed at the top of each piston.

3,699,690

METHOD OF LAYING PIPELINE AND MEANS THEREOF

Michael Watter, deceased, late of 1924 Rittenhouse Square, Philadelphia, Pa. (by Doris Watter, sole executrix)

Filed May 28, 1971, Ser. No. 147,959
Int. Cl. F16l *1/00, 3/00*
U.S. Cl. 61—72.1 **8 Claims**



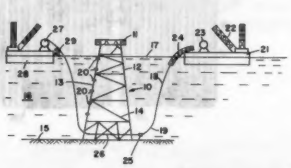
A method of supporting oil pipe beneath the ground by pneumatic inflated sections. The pneumatic inflated sections may be half sections shaped to receive the pipe.

3,699,691

METHOD FOR CONNECTING FLOWLINES TO A PLATFORM

Carl G. Langner, Gainesville, Fla., and Robert C. Visser, Calgary, Alberta, Canada, assignors to Shell Oil Company, New York, N.Y.

Filed Feb. 8, 1971, Ser. No. 113,422
Int. Cl. F16l *1/00*; B02b *17/00*
U.S. Cl. 61—72.3 **9 Claims**



A method for connecting an underwater flowline having a substantial portion thereof lying along the floor of a body of water to an offshore platform structure positioned on the floor. One of the natural sag lines of the flowline is determined and a plurality of flowline clamps (with locks) are installed on

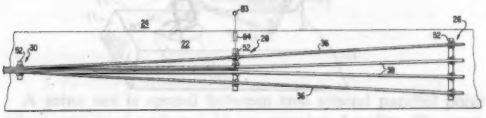
the platform structure substantially conforming to the predetermined natural sag line in such a manner that a line drawn through the locks assumes a shape related to substantially the predetermined natural sag line. The flowline is pulled into engagement with the locks and secured thereto.

3,699,692

METHOD AND APPARATUS FOR LAYING PIPELINES GROUPED IN A BUNDLE

Leif H. Smith, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed July 2, 1971, Ser. No. 159,343
Int. Cl. B63b *35/04*; F16l *1/00*; B65b *13/00*
U.S. Cl. 61—72.3 **32 Claims**



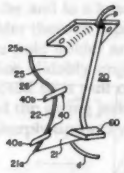
A pipeline laying operation wherein a continuous pipeline bundle comprised of a plurality of conduits is payed out from a floating vessel onto a submerged surface under the control of a tensioned flexible cable. The conduits are strapped to an alignment and spacer member at a plurality of longitudinally spaced bundling zones. The cable, the spacer and the pipeline bundle are placed in a force transmitting relationship, i.e., the weight of the pipeline bundle is transmitted to the cable at the spacer locations. Tension is applied to the cable at the floating vessel, to react the applied pipeline bundle weights at the spacers, maintaining the pipeline bundle conforming to a chosen configuration, which will keep the pipe stresses within a given level. Feed paths, defined by roller assemblies, for each of the conduits on the vessel maintain the end portions of the conduits laterally spaced and induce convergence of the conduits toward a bundling station.

3,699,693

APPARATUS FOR LAYING UNDERGROUND CABLE

Arthur Nelkin, Pittsburgh, and Robert H. Whittaker, Export, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 31, 1970, Ser. No. 59,881
Int. Cl. F16l *1/00*; E02f *5/02*; A01h *3/64*
U.S. Cl. 61—72.6 **8 Claims**



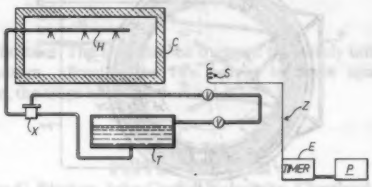
The invention relates to a vibrating plow blade assembly employing laterally protruding auxiliary blades for cultivating soil beneath the ground surface to form an underground cable channel having non-parallel side walls which exert compacting forces on the cultivated soil about a buried cable in response to compaction activity. A thin coulter blade is used to neatly sever the ground surface to maintain surface disturbance at a minimum.

3,699,694

LIQUID NITROGEN REFRIGERATION SYSTEM

Kenneth Calvert Hales, and Gerald Robin Scrine, both of Cambridge, England, assignors to Shipowners Refrigerated Cargo Research Association, Cambridge, England

Filed Oct. 26, 1970, Ser. No. 83,723
Claims priority, application Great Britain, Oct. 27, 1969, 52,548/69
Int. Cl. F25b *19/00*
U.S. Cl. 62—158 **3 Claims**



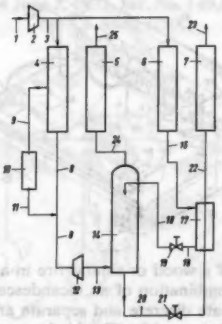
The invention relates to a refrigeration system for a cargo container and a method of refrigerating the container in which the interior of the container is connected with a reservoir of liquid nitrogen, a control valve is provided between the container and reservoir to control admittance of nitrogen to the container and the control valve is caused to be opened and closed for predetermined time intervals. The control valve is opened and closed automatically by a timing device, which is preferably powered by pressure from within the reservoir of nitrogen. However, the timing device may be of any, known type.

3,699,695

PROCESS OF SEPARATING AIR INTO AN OXYGEN-RICH FRACTION SUITABLE FOR BLAST FURNACE OPERATION

Rudolf Becker, Munich-Solln, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Continuation of Ser. No. 590,391, Oct. 28, 1966, abandoned. This application July 22, 1969, Ser. No. 849,556
Claims priority, application Germany, Oct. 29, 1965, L 52016
Int. Cl. F25j *3/00*
U.S. Cl. 62—13 **6 Claims**



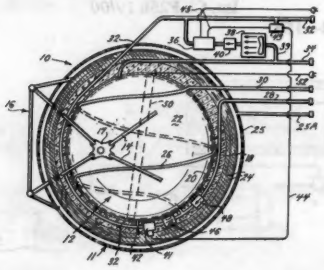
In a process for separating air into an oxygen rich fraction. The gas to be separated is compressed to a high pressure and cooled to almost the liquefaction temperature. A portion of the cooled gas is liquefied and passed through a rectification column. Another portion of the resultant cooled gas is heated and engine expanded and then passed to the rectification column to be placed in heat transfer relationship with the liquid portion.

3,699,696

CRYOGENIC STORAGE AND EXPULSION MEANS

Ronald L. Rhoton, Florissant, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed April 20, 1970, Ser. No. 29,856
Int. Cl. F17c 7/02
U.S. Cl. 62—45 17 Claims



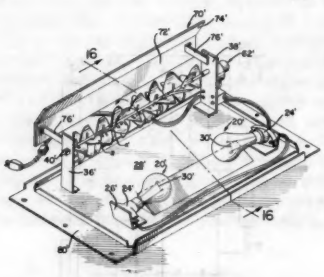
A system for storing cryogen in either a super-critical or a two phase state and for delivering the cryogen therefrom as desired. The system employs a storage vessel with external cooling coils which keep the storage vessel cold either by having isenthalpically expanded cryogen from the vessel vent therethrough when the cryogen is being stored in its super-critical state and/or by having a secondary cooling fluid pumped therethrough especially when the cryogen is being stored in its two phase state. The system also has means to prevent stratification of the super-critical cryogen and to pump heat into the vessel to maintain the super-critical state of the cryogen even when cryogen delivery is at relatively high rates of flow.

3,699,697

ILLUMINATING DISPLAY FOR SIMULATING A FIRE

Claude Arthur Painton, Solihull, England, assignor to United Gas Industries Limited, London, England

Filed Jan. 19, 1970, Ser. No. 3,819
Claims priority, application Great Britain, Sept. 21, 1965, 40,198/65; Jan. 31, 1966, 4,136/66
Int. Cl. G09f 13/36
U.S. Cl. 40—106.53 3 Claims



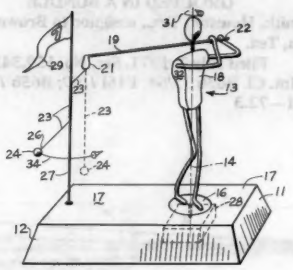
The effect of a wood or similar fire in a fireplace is simulated by the combination of an incandescent light bulb situated to illuminate discrete and separate areas of a rotatable blade or paddle assembly. The blade or paddle assembly is rotated and located behind the incandescent light source and both are enclosed within a shell having the shape, configuration and appearance of a bed of coals, a log fire or the like. The incandescent source or sources are mounted behind opaque portions of the shell and the blade or paddle assembly is rotated and is so constructed as to effect reflection of the incandescent source in such fashion that the reflected light on the interior of the shell moves upwardly and gives the appearance of flickering, thereby to simulate flames.

3,699,698

ANIMATED DISPLAY DEVICE AND METHOD

Peter D. Shiu, 1935 Hopkins Street, Berkeley, Calif.

Filed March 24, 1971, Ser. No. 127,678
Int. Cl. G09f 19/10
U.S. Cl. 40—106.35 10 Claims



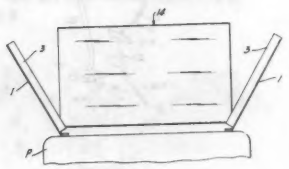
A method and apparatus for animating a display device including a figure mounted for rotation on a support for the device and having a laterally extending element from the body of the figure with a flexible tendon secured thereto and an action element secured to the free end of the tendon is disclosed. Additionally, a stationary reaction rod is positioned adjacent the figure, and figure driving means is connected to rotate the figure. On rotation, the weighted action element swings outward under centrifugal force, and the figure dwells or remains in a stationary position facing a predetermined side of the display when the tendon engages the reaction rod winds, unwinds and swings free thereof in the manner of an escapement mechanism. The reaction rod, weighted element and preferably the projecting element are all formed as objects relating to an activity being simulated by the figure. Various constructions of the driving means are shown.

3,699,699

DISPLAY DEVICE

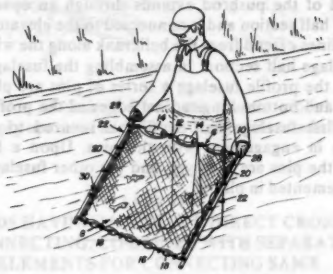
Ronald L. Bramble, Milwaukee, Wis., assignor to Frank Mayer & Associates, Inc., Grafton, Wis.

Filed July 12, 1971, Ser. No. 161,639
Int. Cl. G09f 1/00
U.S. Cl. 40—125 H 4 Claims



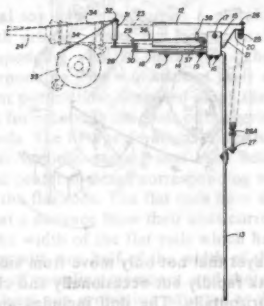
A display device which can be stored in a substantially flat manner and which can be easily assembled into a three dimensional display. Certain parts of the device are formed from molded plastic and have integral hinges which can be repeatedly flexed without weakening them.

3,699,700
MINNOW SEINE POLES
Earl G. Kinsell, P.O. Box 164, Millsboro, Pa.
Filed Dec. 31, 1970, Ser. No. 103,139
Int. Cl. A01k *73/12*
U.S. Cl. 43—14 **2 Claims**



A seine net is spread between two spaced parallel poles whose rearward ends provide appropriate handles. The marginal side portions of the net are provided with an attached line which is releasably connected to the poles by resilient adapter clips.

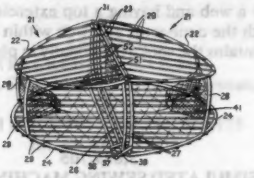
3,699,701
FISH HOOK SETTERS
Louis L. Jacobs, 1720 Pearl Street, Denver, Colo.
Filed Aug. 2, 1971, Ser. No. 167,960
Int. Cl. A01k *97/00*
U.S. Cl. 43—15 **9 Claims**



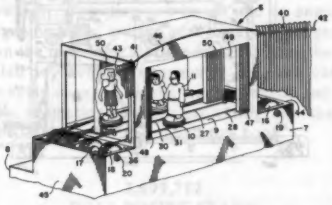
A fish hook setter comprising a support and a pole holder pivotally mounted thereon with a tension spring secured to the rear end of the pole holder and to a bracket on the support. A trigger having a line holder thereon is pivotally secured to the support forwardly of the pole holder and is held in operative position by a lever which slidably engages the pole holder. When the trigger is pivoted by a pull on the line, it is disengaged from the lever and the spring jerks the pole holder with the fishing rod therein sharply upwardly to set the hook in the fish's mouth.

3,699,702
BOTTOM OPENING SHELLFISH TRAP
Richard F. Lankenau, 1207 Bonita Avenue, Mountain View, Calif.
Filed Feb. 8, 1971, Ser. No. 113,511
Int. Cl. A01k *69/08*
U.S. Cl. 43—100 **4 Claims**

Shellfish trap is made of two substantially semi-cylindrical halves with the tops sloping downwardly-outwardly from the center and the sides outwardly curved so that the trap settles in the water in upright position. The halves are hinged together at the top by removable hinges and latched together at the bottom. The trap may be dumped by merely unlatching the bottom, allowing the two halves to pivot apart. For storage, the traps nest together in a stack.

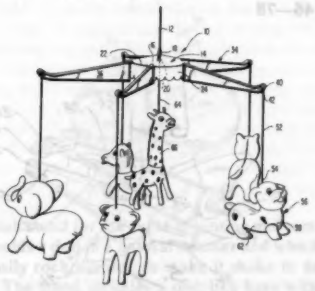


3,699,703
PUPPET THEATER
Thomas C. Biecker, John Carroll University, Cleveland, Ohio
Filed May 20, 1970, Ser. No. 38,919
Int. Cl. A63h *33/00*
U.S. Cl. 46—13 **19 Claims**



A puppet theater having a stage on which dolls and other figures are movable. The dolls are each frictionaly mounted in upstanding relation on a circular base which is slidable on the stage. A continuous cable is reeved around each doll base and pulleys rotatably mounted adjacent the lateral sides of the stage. The pulleys are rotated and used to move the cable and manipulate each attached base and doll on the stage.

3,699,704
AMUSEMENT AND EXERCISE DEVICE
Albert S. Hakim, P.O. Box 4826, Monroe, La.
Filed June 3, 1971, Ser. No. 149,623
Int. Cl. A63h *3/50*
U.S. Cl. 46—32 **4 Claims**



Suspended toys for infants are formed of flexible material and incorporate sound emission means operated in response to manipulation, as by squeezing, of the toys. One form of the invention comprehends the suspension of the squeeze toys on elastic cords, and the employment of a demountable assembly which supports the toys in the fashion of a mobile. The suspen-

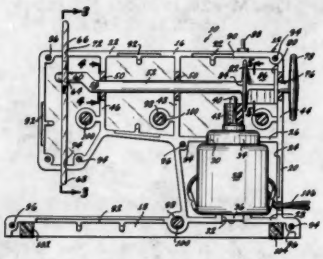
sion assembly includes a hub with a series of T-form slots about its periphery, and a spoke with an internal vertical wall and a vertical connector, said wall and connector being spanned by a web and having a top extension which seats on the hub with the connector and web within the slot. A wedge feature maintains the spoke frictionally in place.

3,699,705

SIMULATED SEWING MACHINE TOY

Charles D. Clarke, Redondo Beach, and Donald C. Hartling, Garden Grove, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 15, 1971, Ser. No. 198,903
Int. Cl. A63h 33/30
U.S. Cl. 46—39 2 Claims



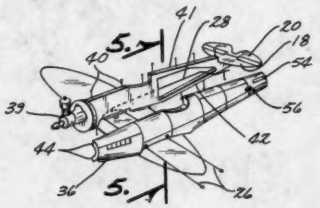
Horizontal shaft with crank on one end and driving disc on other end is rotated by vertical motor output shaft engaging face of disc while crank rides in needle slot to reciprocate simulated, flat plastic needle having blunt tip.

3,699,706

MODEL AIRPLANE AND METHOD OF ASSEMBLING SAME

Glen Sigafoose, 401 South Front, Montezuma, Iowa

Filed Dec. 4, 1970, Ser. No. 95,059
Int. Cl. A63h 27/00
U.S. Cl. 46—78 7 Claims



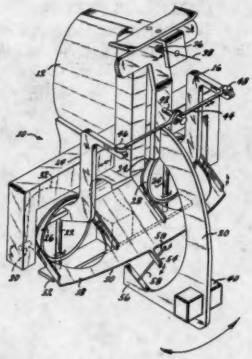
A model airplane including a profile fuselage of flat balsa wood and including a balsa wood tail assembly and wing. Convex outwardly fuselage half sections of sheet-like plastic material are secured to the profile fuselage by cement being placed along the top and bottom longitudinal edges of the profile fuselage for securing the longitudinal edges of the fuselage half sections. The profile fuselage includes a cutout adjacent the wing in which a bellcrank is positioned connected to a pushrod extending rearwardly along the profile fuselage and through an opening formed in the profile fuselage. The rear end of the pushrod extends through an opening in the fuselage half section and is connected to the elevator. Leadout control lines extend from the bellcrank along the wing through the fuselage half section. In assembling the fuselage half sections to the profile fuselage a series of pins are placed along the top and bottom longitudinal edges of the profile fuselage and a first fuselage half section is secured to the profile fuselage in engagement with the pins. Upon a bond being formed the pins are removed and the other fuselage half section is cemented in place.

3,699,707

DOLL WITH BLINKING EYELIDS MOVED BY A PENDULUM

Jurgis Sapkus, Manhattan Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Aug. 23, 1971, Ser. No. 173,886
Int. Cl. A63h 3/38, 3/40
U.S. Cl. 46—166 7 Claims



A doll with eyes that not only move from side to side, but which also blink rapidly but occasionally and close when the doll is laid horizontally. The doll includes an eyelid lever which can pivot up and down to cover and uncover the eyes, and a pendulum which swings laterally. The pendulum carries a resilient wire that can brush against a projection on the eyelid lever to quickly pivot it to cover the eyes, and then quickly release from it to allow the eyes to be uncovered. The eyelid lever is weighted so that the eyelids thereon cover the eyes when the doll is laid horizontally and face up.

3,699,708

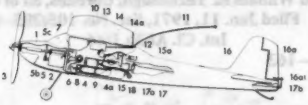
ELECTRIC-POWERED MODEL AIRPLANE

Kenichi Mabuchi, Tokyo, Japan, assignor to Mabuchi Motor Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1971, Ser. No. 203,516
Claims priority, application Japan, Dec. 2, 1970, 45/106019; Oct. 26, 1971, 46/84305
Int. Cl. A63h 27/00, 33/26
U.S. Cl. 46—243 AV 6 Claims

A novel electric-powered model airplane is for the first time disclosed which has an electric motor for driving a propeller and a specific dry cell mounted thereon, said dry cell being of

a high capacity, small size and light weight and, if desired, encased in a case with a plurality of openings or fins for heat radiation. The model airplane may be provided with a remote



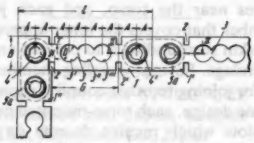
control device, if desired. Thus, the present model airplane can be simply operated and affords enjoyment to adults as well as children.

3,699,709

RODS HAVING MEANS FOR DIRECT CROSS-CONNECTING, COMBINED WITH SEPARATE ELEMENTS FOR CONNECTING SAME

Otto Schmidt, Schwindstrasse 16, Hamburg, Germany

Filed Nov. 15, 1971, Ser. No. 198,560
Claims priority, application Germany, Nov. 17, 1970, P 20 56 384.2; Oct. 21, 1971, P 21 52 341.1
Int. Cl. A63h *33/08, 33/10*
U.S. Cl. 46—29 **5 Claims**



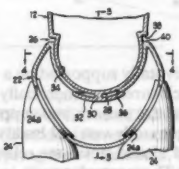
A structural toy which comprises a plurality of flat rods equipped with grooves along the longitudinal edges having widths corresponding with the thickness of the flat rods and depths corresponding with a quarter of their width. The flat rods have first perforations disposed along their longitudinal axis, adapted for receiving the ends of crosswise connectable further flat rods. The first perforations comprise three at least partly circular sections passing into each other and having diameters and center spacings corresponding with one half of the width of the flat rods. The flat rods have circular second perforations at a distance from their ends corresponding with one half of the width of the flat rods which have a diameter corresponding with one half of the width of the flat rods for the reception of coupling members, and the coupling members have at least one projection adjusted to the diameter of the first and second perforations in the flat rods.

3,699,710

DOLL JOINT

Marvin I. Glass, and Rouben T. Terzian, both of Chicago, Ill., assignors to Marvin Glass & Associates

Filed March 31, 1971, Ser. No. 129,761
Int. Cl. A63h *3/36*
U.S. Cl. 46—162 **3 Claims**



A toy doll having upper and lower torso components movably related to each other and characterized by the connection of the two-torso components together by means which permits rotational movement of one torso component relative to the other as well as a bowing or dipping movement simultaneous with the rotational movement.

3,699,711

TRACKED VEHICLE TOY

Francis T. Coffey, Sr., 430 South Fremont Avenue, Alhambra, Calif.

Filed Feb. 3, 1972, Ser. No. 223,175
Int. Cl. A63h *19/36*
U.S. Cl. 46—216 **8 Claims**

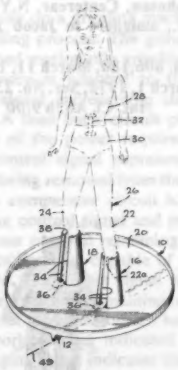
A vehicular toy comprising one or more concentric carrier rings, each ring having a pair of radially spaced, concentric, upwardly disposed tracks and an annular upwardly opening channel between the tracks, an annular tow ring in the channel of each ring, each tow ring having circumferentially spaced upwardly projecting tow hooks and an annular series of gear-engaging parts, a drive gear engaging the gear-engaging parts on the tow rings, a prime mover driving the gear and four-wheeled toy vehicles engageable on each carrier ring with the wheels engaged on the tracks thereof and having a downwardly projecting tow pin projecting into the channel between the tracks and engaged by a tow hook.

3,699,712

DOLL POSING STAND

Elliot Handler, Los Angeles; Noel F. Beasley, Santa Monica; Armando J. Garcia, Sylmar, and Richard L. May, Manhattan Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 1, 1971, Ser. No. 111,342
Int. Cl. A63h *13/00*
U.S. Cl. 46—116 **8 Claims**



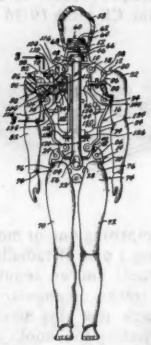
A simple doll stand for the rapid mounting and removal of a doll, which holds a doll in a natural manner and which enables a child to easily rock the doll to make it shake in dance-like movements. The stand includes a disc-like base with ribs extending from a lower face to rockingly support the base on a flat surface. A pair of tubular foot-holders extend from the upper face of the base, each tubular holder having a slot along the front so that a doll's leg can be held within the slotted tube with the foot of the doll protruding through the slot. The tubular foot-holders are detachable and can be mounted to extend from the same side of the base as the ribs, so that the stand does not rock.

3,699,713

APPENDAGE ANIMATING MEANS FOR FIGURE TOYS

Jurgis Sapkus, Manhattan Beach; J. Stephen Lewis, Pacific Palisades, and Robert N. Sporrong, Hermosa Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 17, 1971, Ser. No. 199,602
Int. Cl. A63h *11/00*
U.S. Cl. 46—119 5 Claims



A figure toy appendage, such as an arm, is rotatably connected to a pinion gear having a hollow hub frictionally engaged by an appendage portion so that a rack, which is swingably mounted in the figure toy body in driving engagement with the pinion, may be used to swing the appendage by rotating the pinion while leaving the appendage free to be manually swung to different posed positions by overcoming the frictional drag between the hollow hub and the hub-engaging appendage portion.

3,699,714

DOLL HAVING A SUBSTANTIALLY SEAMLESS FOAMED INTEGRAL TORSO AND NECK PORTION

Richard Bruce Johnson, Centerear, N.Y., and George Winn, Livingston, N.J., assignors to Jacob J. Rosen, New York, N.Y.

Division of Ser. No. 806,180, March 11, 1969. This application March 1, 1972, Ser. No. 230,967
Int. Cl. A63h *9/00*
U.S. Cl. 46—156 11 Claims

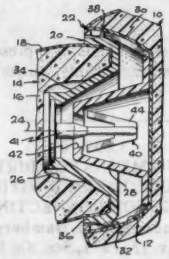
Methods and means for producing foamed articles such as doll bodies which are substantially seamless. A limited internal discontinuity is defined during the foaming operation, and stripping of the article through a limited opening in a seamless mold part is accomplished by urging portions of the foamed article into the internal discontinuity. Pressurized gas is introduced between the article-forming surfaces of the mold cavity and the foamed article to facilitate the stripping operation.

3,699,715

FLOPPY FOAM DOLL

J. Stephen Lewis, Pacific Palisades; Jurgis Sapkus, Manhattan Beach; Earl O. Antell, Gardena; George E. Robson, Torrance, and William R. Yarbrough, Cerritos, all of Calif.

Filed Jan. 11, 1971, Ser. No. 105,295
Int. Cl. A63h *3/46*
U.S. Cl. 46—163 9 Claims



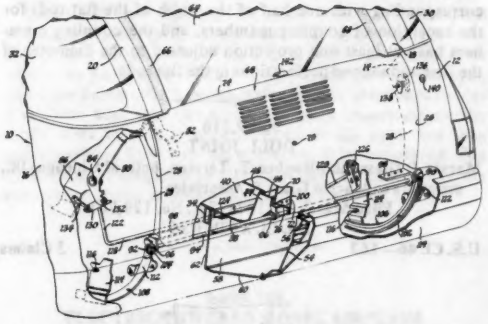
A doll constructed with a foam torso and appendages, and with joints that permit free appendage movements within a limited range. Each appendage is formed of foam which is completely covered by a water-proof skin except at the inner end which lies near the torso, and each joint includes a coupling member that covers the inner appendage end and is sealed to the skin surrounding it to prevent entrance of water into the appendage. Several coupling members are mounted on the torso for joining to other coupling members on the appendage. In one design, each torso-mounted coupling member has several slots which receive detents on an appendage-mounted coupling member to permit limited moved of the appendage, although the appendage may be forced to turn so that the detents move out of one slot and into an adjacent slot.

3,699,716

CLOSURE MOUNTING MEANS

Bert R. Wanlass, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 16, 1970, Ser. No. 72,685
Int. Cl. E06b *3/44*
U.S. Cl. 49—40 4 Claims



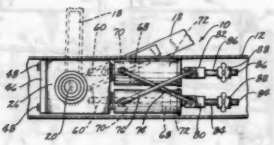
A control arm pivotally supported on a vehicle body has one end affixed to a closure asymmetrically with respect to the center of gravity of the closure and supports the latter on the vehicle body for generally vertical bodily shiftable movement between open and closed positions relative to an opening in the vehicle body. The control arm is indirectly rigidified by movement synchronizing means which equalize vertical movement of opposite edges of the closure to prevent tilting of the closure and twisting of the control arm.

3,699,717

AIR DOOR OPERATOR

Lloyd C. Hedrick, 912 Washington, Pleasantville, Iowa

Filed Sept. 9, 1970, Ser. No. 70,848
Int. Cl. E05f 13/00, 15/04
U.S. Cl. 49—264 9 Claims



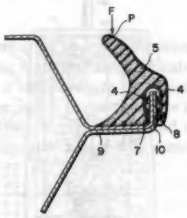
A pivotal door is powered towards both open and closed positions by a shaft connected to a gear engaging a pair of rack members connected to double acting air cylinders inturn connected to a solenoid valve which is responsive to switches in the door carpet such that each of the air cylinders assist in both opening and closing the door. The operation of the door operator is buffered by the metering of oil between cylinders for the rack members having pistons thereon.

3,699,718

PACKING STRIP STRUCTURE

Yoh Kimura, Hiroshima-ken, Japan, assignor to Nishikawa Rubber Co., Ltd., Hiroshima-ken, Japan

Filed Jan. 18, 1971, Ser. No. 107,370
Claims priority, application Japan, Jan. 22, 1970, 45/5530
Int. Cl. E06b 7/16
U.S. Cl. 49—491 10 Claims



A packing strip structure is provided in which an opening of a packing member receives at least one mounting member comprising a plurality of tongue-bearing rectangular-sections connected together and bent generally into a U-shape. The mounting member is positioned and arranged so that the packing strip structure can bend freely laterally and longitudinally and otherwise, in various arcs and in various ways, to achieve maximum conformity and to adaptability for use with various edge flanges or other parts on which the structure is to be mounted.

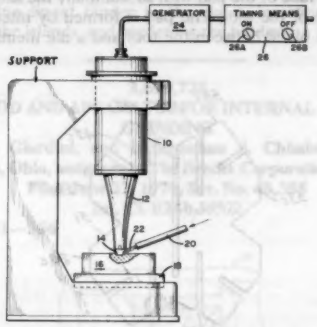
3,699,719

ULTRASONIC MACHINING

Nicholas Rozdilsky, 92 Middle River Road, Danbury, and Hans J. Wilkens, Cold Spring Drive, Fairfield, both of Conn.

Filed Jan. 25, 1971, Ser. No. 109,452
Int. Cl. B24b 1/00, 31/00
U.S. Cl. 51—59 SS 8 Claims

The speed of ultrasonic abrasive slurry machining is improved by providing alternate periods during which the vibrating tool while urged against the workpiece is active and inactive.

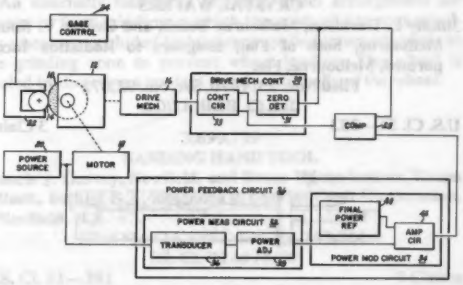


3,699,720

ADAPTIVE CONTROL FOR A GRINDING MACHINE

Ronald L. Lenning, Wilmington, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed April 26, 1971, Ser. No. 137,286
Int. Cl. B24b 49/04
U.S. Cl. 51—165.77 7 Claims



An apparatus for use on a grinding machine for adaptively controlling the grinding process. The grinding process is initiated by a coarse-feed motion of a grinding tool into a workpiece. A gaging device is adapted to the workpiece and produces a gaging signal representing the excess material remaining thereon. A feed back circuit produces a control signal as a function of the power required by the grinding process, and the control signal represents an amount of material capable of being removed from the workpiece by the measured power. A comparator circuit is responsive to the gaging signal and the control signal and produces an output signal when the excess material remaining on the workpiece equals the amount of material capable of being removed by the measured power. The output signal is operative to terminate the coarse feed, and the remaining material is removed primarily as the result of the force which has built up between the tool and the workpiece as indicated by the measured power. When the gaging signal indicates the part is ground to size, the tool is retracted from the workpiece.

3,699,721

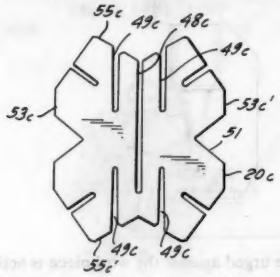
GRINDING PAD

George A. Beasley, Ft. Lauderdale, Fla., assignor to Itek Corporation, Lexington, Mass.

Filed Aug. 22, 1967, Ser. No. 662,379
Int. Cl. B24d 7/00, 9/00, 17/00
U.S. Cl. 51—209 DL 8 Claims

The method of providing a replaceable grinding pad for a lens grinding tool, having a surface thereon for grinding optical and ophthalmic lenses. The pad is formed about the curve

determining surface of the grinding tool, thus providing the grinding surface of the pad with substantially the same curvature as that of the tool. The pad is formed by interposing a sheet metal blank between the tool and a die member of an



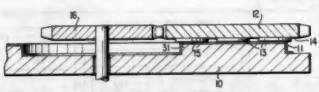
elastic material and thereafter deforming the blank with the tool by depressing it into the elastic material, whereby to form a grinding pad having the same configuration as that of the tool.

3,699,722

PRECISION POLISHING OF SEMICONDUCTOR CRYSTAL WAFERS

Jimmy L. Davidson, Melbourne Beach, and George V. Rouse, Melbourne, both of Fla., assignors to Radiation Incorporated, Melbourne, Fla.

Filed Nov. 23, 1970, Ser. No. 92,072
Int. Cl. B24b *37/04*
U.S. Cl. 51—283 **3 Claims**



A method of polishing semiconductor crystal wafers in which a planar array of wafers is rotated about an axis normal to its plane while rotating a polishing surface in contact with a face of each wafer of the array in the same sense as the sense of rotation of the array, about an axis displaced from and parallel to the axis of rotation of the array. The wafer is displaced from the polishing surface at locations closest and furthest from the axis of rotation to eliminate the extremes of rotational velocity.

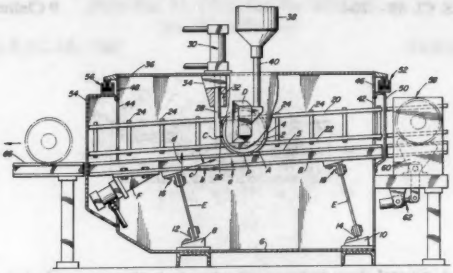
3,699,723

APPARATUS FOR SUPPORTING AND ROTATING A CIRCULAR WORKPIECE

Joseph T. Wloszek, Cuyahoga, Ohio, assignor to Custom Machine, Inc., Cleveland, Ohio

Filed Jan. 22, 1971, Ser. No. 108,871
Int. Cl. B24b *41/06*
U.S. Cl. 51—236 **15 Claims**

Apparatus for supporting and rotating cylindrical members while being treated. The member is mounted upright on a rail which slopes downwardly toward the work station. On the downhill side of the work station, there is a stop to hold the wheel at the station until it is fully treated. The rail is vibrated on a line of movement between a vertical line and the uphill slope of the rail so that the member is raised slightly off the rail and away from the stop and then falls back onto the rail and rolls downhill against the stop. Another embodiment uses a mechanism of the slow-work-stroke-and-quick-return type, so that on the uphill stroke of the rail, the member rotates on the rail, whereas on the return stroke, the rail moves fast enough to slide under the member. In another embodiment, the rail is moved longitudinally a distance sufficient to rotate the wheel in its position against the stop through the required arc.

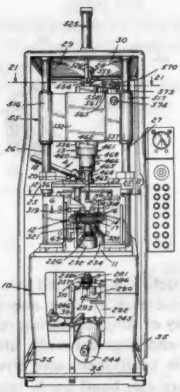


3,699,724

A METHOD FOR SIMULTANEOUSLY MACHINING THE CENTER BORE OF A GEAR WORKPIECE AND THE END FACES PERPENDICULAR TO THE AXIS OF THE CENTER BORE

Myron P. Ellis, Royal Oak; Albin S. Czubak, Detroit, and Keith A. McDonald, Union Lake, all of Mich., assignors to Micromatic Hone Corporation, Detroit, Mich.

Division of Ser. No. 701,447, Jan. 29, 1968, Pat. No. 3,525,178. This application Aug. 19, 1970, Ser. No. 65,160
Int. Cl. B24b *1/00*
U.S. Cl. 51—287 **2 Claims**



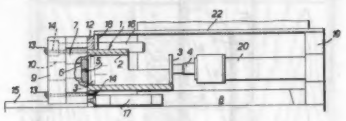
A multi-surface machining method for simultaneously machining the center bore of a gear workpiece concentric to the pitch circle of the gear teeth, and machining one or both of the end faces of the gear workpiece perpendicular to the axis of the center bore. The gear workpiece is rotated in a centerless manner by a pair of master gears comprising a driving gear and a braked retainer gear. The master gears improve the surface finish characteristics of the tooth flanks of the gear teeth while rotating the gear workpiece. Simultaneously, a first machining means is reciprocated axially in the gear workpiece center bore, and a second machining means is reciprocated over one or both of the end faces of the gear workpiece in a direction perpendicular to the axis of the center bore.

3,699,725

METHOD OF FINISHING AN APERTURE

Edward George Feldcamp, 60 Robert Burns Avenue, Benhall, England

Filed Sept. 17, 1970, Ser. No. 73,110
Claims priority, application Great Britain, Sept. 17, 1969, 45,940/69
Int. Cl. B24b *1/00*
U.S. Cl. 51—317 7 Claims



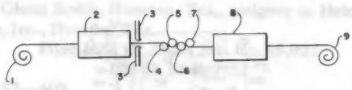
A method of finishing a pre-formed aperture in a metal component, for example an extrusion tool opening, to achieve a desired surface finish for the side wall of the aperture, comprises the step of forcing a wax-like abrasive compound through the aperture. Apparatus performing the method comprises a cylinder at one end of which a tool holder can be mounted. A ram-operated piston is reciprocable in the cylinder to force the abrasive compound through the extrusion tool when mounted in the holder.

3,699,726

METHOD OF DESCALING

Charles A. Turner, and Ernst A. Siemssen, both of Selas Corporation of America, Dresher, Pa.

Filed March 26, 1971, Ser. No. 128,275
Int. Cl. B24c *1/00*
U.S. Cl. 51—319 8 Claims



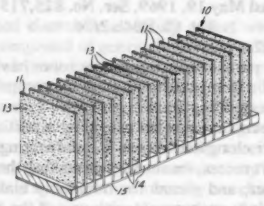
Dry descaling of steel strip by a combination of thermal and mechanical treatments. A strip of steel is heated in normal furnace atmosphere to a temperature at which the magnetite scale converts to softer, more porous wustite and then rapidly cooled by air jets. Subsequently, the cooled strip is flexed to crack the scale and abrasive blasted to remove the cracked scale.

3,699,727

ABRASIVE ARTICLE AND METHOD OF FABRICATION

William J. McDonald, Stillwater Township, County of Washington, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed April 30, 1971, Ser. No. 139,088
Int. Cl. B24b *11/00, 9/02*
U.S. Cl. 51—334 13 Claims



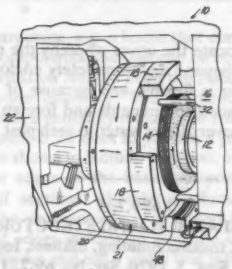
A continuous elongate flexible sheet bearing erect abrasive flaps, each held by an individual island of binder that is adherently bonded to the flexible support, can be formed into an abrasive flap wheel, endless belts, etc. The article is prepared by applying liquid binder to the sheet, inserting the flaps, isolating the islands, and hardening the binder.

3,699,728

METHOD AND APPARATUS FOR INTERNAL PLUNGE GRINDING

Dante S. Giardini, and Indarmohan S. Chhabra, both of Dayton, Ohio, assignors to The Bendix Corporation

Filed June 22, 1970, Ser. No. 48,355
Int. Cl. B24b *55/02*
U.S. Cl. 51—356 5 Claims



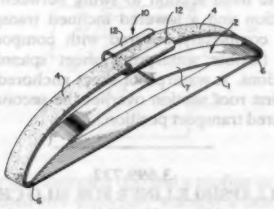
An internally lubricated grinding wheel arrangement for plunge or form grinding in which the voids of a porous grinding wheel are occluded by lubricant applied internally while in the grinding zone to prevent wheel loading. The wheel is cooled by directing a coolant supply externally of the wheel.

3,699,729

SANDING HAND TOOL

Francis J. Garvey, Newfield, and Bruce Winterbottom, Green Bank, both of N.J., assignors to Carrier Craft Corporation, Newfield, N.J.

Filed May 14, 1971, Ser. No. 143,316
Int. Cl. B24d *15/00*
U.S. Cl. 51—391 7 Claims



A sanding hand tool comprises an abrasive-surfaced strip of cloth in narrow endless belt form looped around a bow-shaped holding member of resilient metal having a convex rear surface on which a rear, reserve portion of the belt snugly fits and a concave front across which the remainder of the belt is exposed to provide an operative portion stretched under yieldable tension.

3,699,730

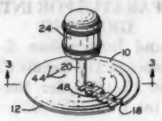
SUMP PUMP COVER

Burnice Lee Humphrey, 404 West Race Street, Portland, Ind.

Filed March 25, 1971, Ser. No. 128,043
Int. Cl. F16j *13/02*
U.S. Cl. 52—19 9 Claims

Sump pump covers of wood and steel are most frequently used to provide covers over the open sump where water is collected and must be exhausted from time to time. The present

invention is a sump pump cover of dome-like flexible construction, and having a radial slot which permits the outlet of the sump to pass therethrough. The cover has locking members at its undersurface which are adjustable and which are spaced from each other to engage the interior surface of the



sump opening to locate the cover whereby the outer edge of the cover extends beyond and completely encloses the sump opening. The cover is flexible and because of its curvature tends to shed surface contaminants and foreign objects. The outer edge of the cover allows water to seep past and enter the sump.

3,699,731

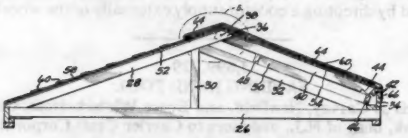
MODULAR BUILDING STRUCTURE

Thomas R. Arnold, Indiana Building, Elkhart, Ind.

Filed Sept. 3, 1970, Ser. No. 69,221

Int. Cl. E04h *1/00*

U.S. Cl. 52—64 **2 Claims**



A modular building structure adapted to be prefabricated and transported to an erection site, and having an inclined roof consisting of a lower fixed section and an upper section pivoted to the fixed section to swing between an operative erected position and a lowered inclined transport position. The roof is completely covered with composition roofing overlying a flexible waterproof sheet spanning the joint between sections. A waterproof sheet anchored to the upper part of the first roof section overlies the second roof section when in lowered transport position.

3,699,732

COLLAPSIBLE LINER FOR SILO CHUTE

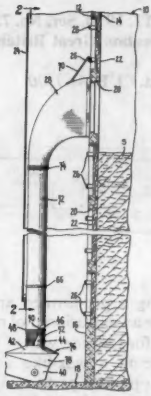
Gail E. Janssen, and Henry N. Wildenberg, both of Kaukauna, Wis., assignors to Badger Northland, Inc., Kaukauna, Wis.

Filed March 8, 1971, Ser. No. 121,913

Int. Cl. E04h *7/00;* **B65g** *11/10;* **B65d** *5/06*

U.S. Cl. 52—195 **6 Claims**

A collapsible discharge chute liner, for an upright silo having a plurality of doors and a vertical discharge chute, including a funnel assembly, a flexible tube, and a flexible tube storage assembly. The funnel includes hooks which hold it in communication with any of the silo doors and tight against the side of the silo. A flexible tube is attached to and supported by the assembly. A flexible tube storage assembly is provided to store excess flexible tube material for reuse as the funnel assembly is lowered from one of the silo doors to the next silo door. The flexible tube storage assembly may include a chamber assembly connected to a conveyor at the bottom of the silo with an inlet pipe having a flange on its upper end. The inlet pipe extends up into the flexible tube and excess flexible tube material is stored on the inlet pipe in an accordion folded condition. For installations where a chamber assembly is undesirable, a reel upon which the flexible tube can be wound may be provided. With a reel for the storage of the flexible



tube, a zipper is provided, to open an opening for silage, in the side of the flexible tube.

3,699,733

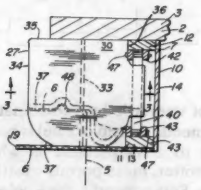
LOADING DOCK SHELTERS

Cyril P. Frommelt, and Sylvan J. Frommelt, both of Dubuque, Iowa, assignors to Dubuque Awning & Tent Company, Dubuque, Iowa

Filed Oct. 30, 1970, Ser. No. 85,610

Int. Cl. E04f *10/04;* **E06b** *1/56*

U.S. Cl. 52—204 **5 Claims**



A loading dock shelter embodying a cover member carried by a rigid supporting frame with a resilient pad forming the bottom wall therefor and holding the lower portion of the cover in operative position.

3,699,734

PARTITIONING SYSTEM HAVING REMOVABLE PANELS

Robert D. Craig, Lisle; Richard O. Evans, Glenview, and Gerald F. Grant, Wood Dale, all of Ill., assignors to Anning-Johnson Company, Melrose Park, Ill.

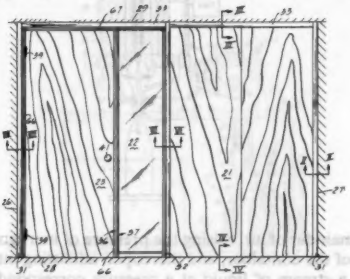
Filed May 19, 1969, Ser. No. 825,715

Int. Cl. E04b *2/74*

U.S. Cl. 52—127 **20 Claims**

A system for partitioning an existing room having a floor, a ceiling and walls into smaller room units comprising at least one vertically extending framing member formed to provide an elongated recess; means for providing a partitioning panel formed with an elongated recess in confronting relationship with the support recess; means for connecting the panel to the framing member; and means for releasably biasing the connecting means into engagement with one of the recesses. The connecting means includes an elongated member interposed between the panel means and the framing member having a first portion slidably received within the recess of the framing member and a second portion slidably received within the

recess of the panel means. Desirably, a vertically extending support member is disposed adjacent to each of the opposed end portions of the panel means with the biasing means of each end portion arranged both to urge the connecting means of each end portion into engagement with the adjacent framing member recess and to urge the panel toward the framing



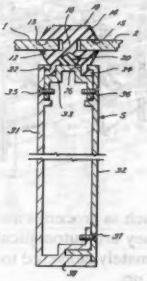
member adjacent to the opposite end portion. Additionally, the connecting means includes means for receiving a tool for moving the connecting means against the biasing means to a position wherein the connecting means will be out of engagement with one of the recesses formed in either the framing member or the panel means, thereby to permit removal of the panel means.

3,699,735

SEALING GASKET

Marvin Glenn Smith, Houston, Tex., assignor to Helmerich & Payne, Inc., Houston, Tex.

Filed June 10, 1970, Ser. No. 45,022
Int. Cl. E04b *1/62*
U.S. Cl. 52—400 **6 Claims**



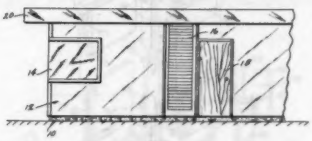
An elongated elastomeric sealing gasket whose cross section may be comprised of generally parallel side portions connected by a web portion to form oppositely disposed channels adjacent to the web portion. Two elongated tongue members project from one of the side portions forming another channel therebetween. There may be a longitudinal groove in the side portion between the tongue members for receiving a longitudinal locking strip. The tongue members may be held in engagement with a structural member by an elongated anchor strip fastened to the structural member. A portion of the anchor strip may be disposed in the channel between the tongue members to prevent deflection thereof and to cooperate with the structural member to form longitudinal recesses in which the tongue members are retained.

3,699,736

BUILDING COMPONENT AND SYSTEM

Howard O. Wallace, 580. A.N. Kalahed, Kailua, Oahu, Hawaii

Continuation of Ser. No. 617,669, Feb. 21, 1967, abandoned. This application May 12, 1969, Ser. No. 840,081
Int. Cl. E04b *1/10, 1/54*
U.S. Cl. 52—436 **4 Claims**



A building structure, e.g. a house that consists of generally-similar basic components and that can be economically manufactured at a location remote from the building site to permit rapid and simple assembly. The elemental building components comprise a generally rectangular frame (wood) which is variously closed at its sides to provide a partial wall, roof or floor. Walls are shown to include windows, etc.

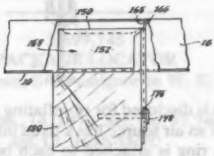
The exterior edges of the basic component frame define matingly-keyed sections whereby a plurality of the components may be permanently interlocked by adhesive. The matingly-keyed edges include an elongate section that is less than a semi-cylinder and has a width that is less than the frame width. The female sections (concave) carry an adhesive, either as encapsulated beads of glue or an adhesive tape bearing a release sheet. In a structure of the elemental components, the adhesive is contained between the mating sections (concave and convex) to bond the building components together.

3,699,737

ROOFING AND SIDING SHEETS AND FASTENING MEANS THEREFOR

William Cookson, Fareham, England, assignor to Cookson Sheet Metal Developments Limited, Southampton, England

Division of Ser. No. 800,835, Feb. 17, 1969, Pat. No. 3,606,720. This application Nov. 13, 1970, Ser. No. 89,164
Int. Cl. E04d *3/30*
U.S. Cl. 52—489 **14 Claims**



An assembly of a fastening clip and a roofing or siding sheet having wide-based ribs especially wherein a lateral male rib has means for interlocking with an overlying lateral female rib of a neighboring sheet, the male rib having a fixing channel for securing the rib to a structural member. The clip acts as a concealed fixing for the intermediate wide-based rib of the sheet, the clip having free arms to engage internal pockets in the rib and camming means secured to its base wall and rotatable relative to the base wall so that a free end of the camming means bears against the base wall of the rib, thereby urging the free arms of the clip into the internal pockets of the rib.

3,699,738

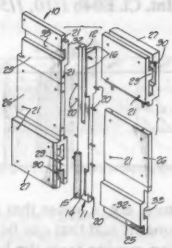
MODULAR STRUCTURAL PLAQUE ASSEMBLY

John G. Merideth, 5000 W. Imperial Highway, Los Angeles, Calif.

Filed May 13, 1971, Ser. No. 143,117
Int. Cl. E04c *1/30*
U.S. Cl. 52—578 **11 Claims**

A modular structural plaque adapted for demountable telescopic assembly in a variety of arrangements with other

similar modular plaques. Each plaque is fabricated by bonding separately molded components together including a bifurcated main frame member and a plurality of panel like members some of which have tongues and channels complemental



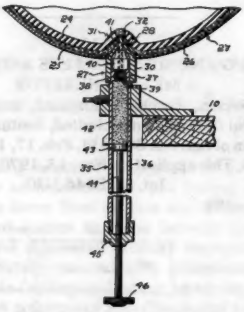
to and interlockable with similar components of one or more other plaques. The plaques are adapted to be interlocked with one another in a wide variety of different patterns and arrangements as respects both their central frame members and their tongue and channel portions.

3,699,739

METHOD AND APPARATUS FOR USE IN INFLATING TENNIS AND OTHER BALLS

Howard A. Burdwood, 1380 Westbrook Street, Portland, Maine

Filed Feb. 3, 1971, Ser. No. 112,239
Int. Cl. B65b *31/04*
U.S. Cl. 53—7 **12 Claims**



Apparatus is disclosed for re-inflating tennis balls in which a conduit from an air source has a fixed inflating needle exposed on a hub. A ring is attached to each ball and has a receiver provided with an inwardly disposed tip forming a small dimple in the held ball and an outwardly disposed sleeve fitting the hub with the needle then piercing the ball through the dimple to enable the ball to be inflated. A sealant gun has a needle whose hub is dimensioned to fit the receiver with the needle then in the puncture so that when the gun is actuated the sealant is discharged into it. The sealant sets to form a plug in the form of a truncated cone which is compressibly locked in place once the ring is removed.

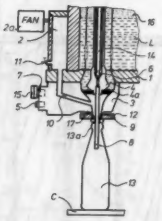
3,699,740

METHOD AND APPARATUS FOR FILLING BOTTLES OR CANS WITH BEER OR THE LIKE

Uwe Knabe, Dortmund-Hombruch, Germany, assignor to Holstein & Kappert Maschinenfabrik Phonix GmbH, Dortmund, Germany

Filed Jan. 27, 1971, Ser. No. 110,209
Claims priority, application Germany, Jan. 29, 1970, P 20 03 909.2
Int. Cl. B65b *31/06*
U.S. Cl. 53—22 R **10 Claims**

Bottles, cans or like containers which tend to undergo deformation in response to excessive reduction of internal pressure below atmospheric pressure are filled with beer or another liquid which is adversely affected by contact with air by evacuating some air from their interior so that the pressure in the interior of a container does not decrease below a pressure at which the container is subject to deformation, circulating through the interior of the container an inert gas to expel



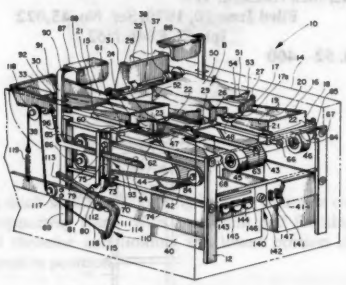
the remainder of air, raising the pressure of inert gas in the interior of the container, and thereupon admitting into the container a stream of liquid at a pressure corresponding to the pressure of inert gas in the interior of the container whereby the liquid expels the gas and fills the container to a desired level. The pressure in the interior of the thus filled container is reduced prior to sealing.

3,699,741

AUTOMATIC BAG PACKING APPARATUS FOR CHECK-OUT

Richard R. Norman, Palos Verdes Peninsula, Calif., assignor to Tony J. Bressickello, Gardena, Calif., a part interest

Filed July 9, 1971, Ser. No. 161,239
Int. Cl. B65b *43/14, 43/36*
U.S. Cl. 53—29 **27 Claims**



After articles such as groceries are loaded into a reciprocable shuttle tray they are automatically bagged, handled continuously and ultimately delivered to a point where the loaded bag can be picked up.

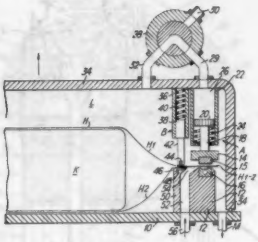
Situated on a holding platform in the path of horizontal movement of the shuttle tray is an open ended kraft paper bag inflated from a previously collapsed condition and oriented to admit both the shuttle tray and groceries being carried by it. When set in motion the shuttle tray travels into the bag and pushes it onto a receiving tray that tilts the bag of articles from a generally horizontal alignment to an erect position and deposits the bag of groceries on a conveyor that leads to a pick-up point.

The individual bags are linked to one another by detachable joints and are stored in a supply hopper. As the shuttle tray drives a bag from the holding station to the receiving tray the motion of the bag serves to automatically pull the next or replacement bag into position onto the holding platform. After the shuttle tray has completed its cycle and has been returned to its initial station the replacement bag is expanded, by air from a blower for example, to accept the next load of groceries carried by the shuttle tray.

3,699,742
APPARATUS FOR VACUUM WELDING OF PLASTICS ENVELOPES

Giorgio Giraudi, Rho, Milan, Italy, assignor to W. R. Grace & Co., New York, N.Y.

Filed Feb. 18, 1971, Ser. No. 116,332
Int. Cl. B65b 31/02
U.S. Cl. 53—86 6 Claims

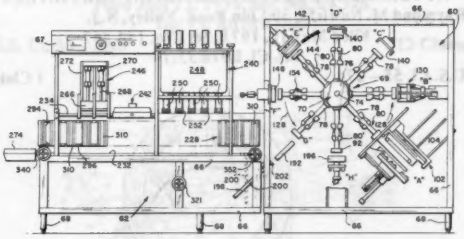


The specification discloses vacuum packaging apparatus including welding bars, and clamping bars for holding the edges of the packaging envelope before, during, and after the welding operation. Preferably the clamping bars may have grooves therein to facilitate escape of air from within the envelope during the evacuation phase. A jet of air is blown across the welded edge to cool the weld and facilitate separation of the welded edges from the welding bars.

3,699,743
CONTAINER FABRICATING MACHINE

Percy King, Bloomington, and Howard R. Garrett, St. Paul, both of Minn., assignors to Haskon Incorporated, Warsaw, Ind.

Filed Jan. 7, 1970, Ser. No. 1,273
Int. Cl. B65b 43/32
U.S. Cl. 53—186 27 Claims

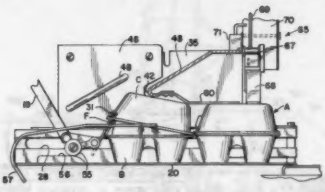


A container fabricating machine having a forming mechanism for erecting and bottom sealing paperboard container blanks and a filling mechanism for filling and top-sealing the bottom formed containers. The bottom forming mechanism includes a plurality of mandrels mounted on a spindle that are intermittently driven past a plurality of the mechanism's operating stations, the bottom formed containers being discharged from the mechanism in a downwardly inclined direction and a transfer mechanism for gripping the bottom of the discharged containers and pivoting them to an upright position. The filling mechanism includes a feeding mechanism that receives the containers from the transfer mechanism and grips all four corners of the bottom formed containers while advancing them through the filling mechanism's filling and sealing operations and that is readily adjustable to accommodate containers of various base sizes without disturbing the machine's overall synchronization.

3,699,744
CARTON CLOSING APPARATUS

Charles H. Willsey, Topeka, Kans., assignor to Seymour Foods, Inc., Topeka, Kans.

Filed April 26, 1971, Ser. No. 137,414
Int. Cl. B65b 61/26, 7/26
U.S. Cl. 53—131 14 Claims

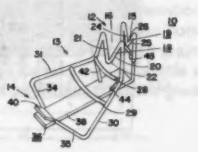


An apparatus for use in filling and closing egg cartons which comprises a frame mounted above a horizontal table onto which a cellular carton with a hinged cover member is adapted to be deposited in open position, so that eggs may be placed therein by an operator, the frame having a cross bar assembly carrying a series of radial fingers mounted at the front thereof which is adapted to be rotated to engage the fingers with a hinged locking panel at the front edge of the carton and to swing the panel into position for locking engagement inside the front wall of the cover member when the latter is closed, the cross bar assembly being movable to advance the filled carton beneath a cover closing assembly which is spaced rearwardly of the front cross bar assembly and above the table and which includes a plate member with the forward edge disposed in the path of the cover member so as to swing it down into closed position and having spring fingers arranged to bear on the cover member and insure engagement of cooperating locking elements on the cover front wall and the locking panel as the carton is advanced by pressure of a succeeding carton which is subsequently advanced beneath the cover closing assembly.

3,699,745
PACKAGE LOCATOR

Philip L. Reid, Lyman, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Dec. 14, 1970, Ser. No. 97,746
Int. Cl. B65b 65/00
U.S. Cl. 53—393 5 Claims



An apparatus for supporting and positioning bagged products and the like including a portion for supporting and positioning the neck of the bag and another portion supporting the bagged product. In preferred embodiments, the portion supporting and positioning the neck of the bag includes a slotted member and the portion supporting the product includes a cradling means at the forward or neck end of the product and other means impinging against the far end of the product to prevent it from sliding out of position.

3,699,746

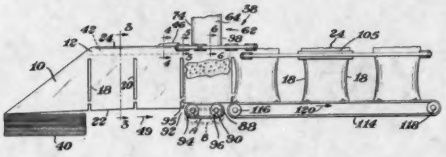
APPARATUS FOR FILLING A CHAIN OF CONNECTED BAG ELEMENTS

Oliver R. Titchenal, and William A. Armstrong, both of Berea, Ohio, assignors to Basic Packaging Systems, Inc., Avon Lake, Ohio

Continuation of Ser. No. 727,545, May 8, 1968, abandoned. This application April 9, 1971, Ser. No. 132,808

Int. Cl. B65b *43/12*

U.S. Cl. 53—187 28 Claims



Apparatus for filling a chain of connected bag elements wherein improved design enables the apparatus to receive the bag elements from a folded pile. This allows the use of bag elements almost totally separated from each other whereby after filling the bag elements can be easily parted, as, for example, by a gentle pulling action. Accordingly, a cutting station to part the bags after filling can be eliminated from the apparatus. Other beneficial features of the invention include the employment of a mandrel to initially mount and align the connected bag elements in the apparatus such that the possibility of fouling the same by misfeeding the bags thereto is minimized, and an intermittently operated filling station which works in combination with a continuously run sealer or closing station to facilitate the pulling apart of the connected bag elements after fill operations.

3,699,747

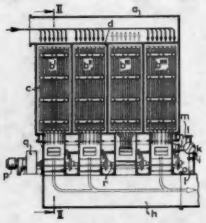
PROCESS FOR CLEANING FILTER ELEMENTS OF FABRIC FILTER EQUIPMENT

Gert Kroll, Bayernstrasse 18, Hosel/Dusseldorf, Germany

Filed Sept. 8, 1969, Ser. No. 855,946

Int. Cl. B01d *46/04*

U.S. Cl. 55—96 6 Claims



A process and apparatus for cleaning the filter elements of a fabric filter equipment in which certain of the filter elements are recurrently shut off from the current dust-laden air, and at such time is exposed to the action of a clean air current under relatively higher pressure, thus causing the filter elements to move alternately in opposite directions. The apparatus includes intermittently rotatable valve means causing the filter elements to be subjected to suction for short times and alternately then to air under pressure for longer periods.

3,699,748

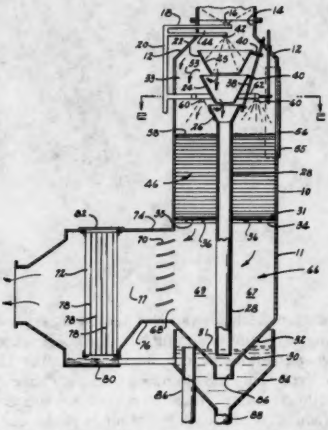
WET SCRUBBER DUST COLLECTOR

William E. Barkovitz, Lincoln Park, Mich., assignor to American Radiator & Standard Sanitary Corporation, New York, N.Y.

Filed Oct. 24, 1969, Ser. No. 869,066

Int. Cl. B01d *45/06, 45/10*

U.S. Cl. 55—223 8 Claims



A wet dust collector or scrubber having an inertial separator section for removing a substantial percentage of the dust particles from the treated gas stream, a porous packing subjected to flushing liquid for producing a concentrated fog and assimilating the remaining dust particles into said fog, and a second separator section for removing the wet dust particles from the gas stream. The first inertial section preferably comprises spaced baffles which are subjected to liquid spray for collection of dust particles and for prevention of clog-up of the baffle spaces.

3,699,749

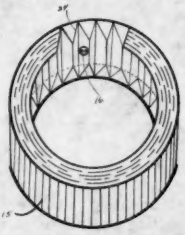
AUTOMOBILE CARBURATOR AIR INTAKE FILTERS

Raymond M. Nowicki, 30 Linn Road, Nutley, N.J.

Filed May 18, 1971, Ser. No. 144,467

Int. Cl. B01d *35/14*

U.S. Cl. 55—274 1 Claim



An annular pleated filter element with a anti-pollution warning reed compression collar device secured to the filtering paper through an aperture within a pleat.

3,699,750

AIR POLLUTION CONTROL APPARATUS

Harold A. Nepereny, Wexford, and John P. Reich, Baden, both of Pa., assignors to Koenig, A. G.

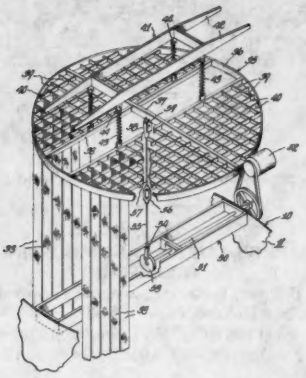
Filed July 17, 1970, Ser. No. 55,653

Int. Cl. B01d *41/00*

U.S. Cl. 55—288 9 Claims

Air pollution control apparatus herein disclosed comprises a large upright casing, with a plurality of elongated air-pervi-

ous bags extending vertically within the casing, each air bag having its lower end fixed to a partition plate in line with an opening in the latter and its upper end closed and fixed to a grid frame. Dust-laden air is caused to flow upwardly through the air bags, the dust being filtered from the air and remaining within the bags and the dust-free air passing into the casing for exhaust through a casing outlet.



The grid frame is spring-supported and means are provided to vibrate the grid frame and consequently the air bags suspended from the grid frame. This vibration is performed at a time when dust-laden air is not being admitted to the casing inlet, and is for the purpose of shaking the dust particles from the interior of the air bags.

The air bags are disposed in two groups with a space therebetween large enough to accommodate a person for the purpose of inspecting the condition of the air bags.

3,699,751

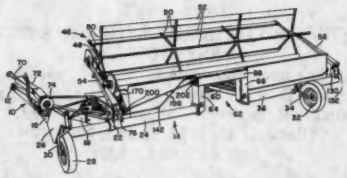
WINDROWER DRIVE MEANS

Brian Francis Ross, St. Catharines, Ontario, and Dalton Harold Spicer, Welland, Ontario, both of Canada, assignors to Deere & Company, Moline, Ill.

Filed July 13, 1970, Ser. No. 54,320

Int. Cl. A01d *43/00*

U.S. Cl. 56—10.3 **12 Claims**



A drive system for the power-operated components of a pull-type windrower, including a fore- and-aft shaft on the windrower draft frame adapted to be driven by the draft vehicle, a first transverse countershaft on the windrower main frame adjacent to and drivingly connected with the fore- and-aft shaft, and a second transverse countershaft on the main frame above and spanning the swath opening in the central portion of the frame and drivingly connected with the first transverse countershaft. A reciprocating cutter bar on the leading edge of the windrower grain platform and a transverse reel mounted above and forwardly of the cutter bar are driven from the first countershaft, the reel drive including a spring overload release mechanism, and a pair of platform canvases on opposite sides of the swath opening are driven from the second countershaft.

3,699,752

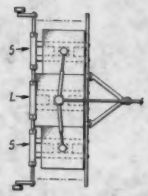
MODULAR CONSTRUCTED ROTARY MOWER

John E. Dandl, 211 West 16th Street, Chico, Calif.

Filed May 17, 1971, Ser. No. 143,918

Int. Cl. A01d *75/30*

U.S. Cl. 56—13.6 **7 Claims**



A modular constructed rotary mower is provided with structural module means, a gear box assembly, a depending shaft and a rotary mower blade. Front and rear bars are attached to the structural module means. Hitch means are attached to the front bar and running gear are attached to the rear bar.

3,699,753

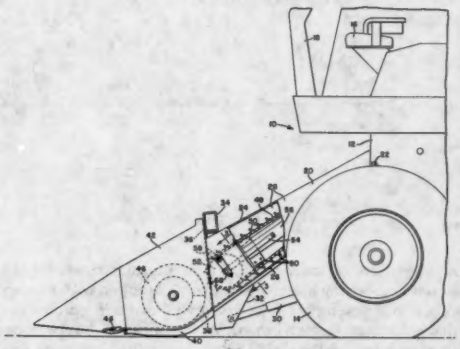
QUICK-ADJUSTABLE LOWER STOP FOR FEEDER HOUSE DRUM

Charles Benjamin Peak, Geneseo, Ill., assignor to Deere & Company, Moline, Ill.

Filed Jan. 31, 1972, Ser. No. 221,998

Int. Cl. A01d *41/02*, *45/02*

U.S. Cl. 56—14.5 **12 Claims**



The lower stop for a combine feeder house drum can be rotated to present either one of a pair of stop surfaces which are positioned unequal distances from the axis of rotation of the stop so that by rotation of the stop member, the minimum clearance of the drum with respect to the bottom wall of the feeder house can be easily varied for small grain and corn. The lower drum stop is also carried by a rotatable cam which can be used to provide fine adjustments for the feeder house lower drum stop.

3,699,754

CONDITIONER MOUNTING FOR A WINDROWER

Earl E. Koch, Mohnton, Pa., and Joe E. Shriver, Lebanon, Ohio, assignors to Sperry Rand Corporation, New Holland, Pa.

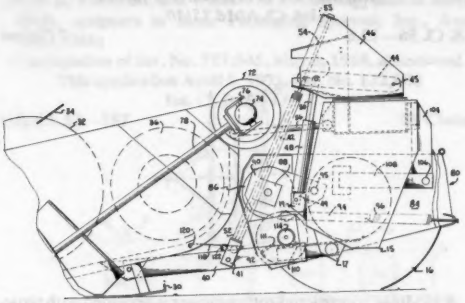
Filed May 28, 1971, Ser. No. 148,044

Int. Cl. A01d *47/00*

U.S. Cl. 56—15.8 **9 Claims**

A conditioning unit adapted for mounting beneath the main frame of a windrower having a front mounted header pivotally connected thereto by a lift mechanism including a pair of

laterally spaced lower lift arms. The conditioning unit is pivotally mounted about the rear thereof to the main frame of the windrower and includes a pair of rollers rotatively



mounted about front outside portions, the rollers being laterally spaced and adapted to rest upon the lower left arms such that the conditioning unit moves proportionally to the movement of the header.

3,699,755

CONDITIONING MACHINES FOR AGRICULTURAL STRAW OR BLADE MATERIAL OR THE LIKE

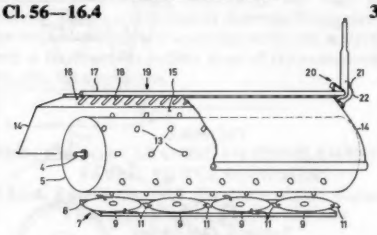
Hans Ulrich Hauser, Lienhard, Watt, Switzerland, assignor to Bucher-Guyer AG Maschinenfabrik, Niederweningen, Switzerland

Filed June 23, 1971, Ser. No. 155,799

Claims priority, application Switzerland, July 24, 1970, 11290/70

Int. Cl. A01d *43/00*

U.S. Cl. 56—16.4 **30 Claims**



A conditioning machine for agricultural straw or blade material embodying a conveying drum equipped with conveying tools or implements. The conveying drum in conjunction with a guide wall forms a conveying channel which is provided with means for exerting a conditioning action upon the conveyed straw or blade material. According to important aspects of the invention the spacing between the ends of the conditioning means situated closest to the jacket or outer surface of the conveying drum and the circular path of travel of the ends of the conveying tools is smaller than the smallest inner height of the conveying channel between the jacket of the conveying drum and the guide wall measured from the axis of rotation of the conveying drum.

3,699,756

MACHINE FOR MANUFACTURING STEEL STRUCTURAL PARTS

Klaus Ritter; Hans Gott; Josef Ritter, and Gerhard Ritter, all of Graz, Austria, assignors to EVG Entwicklungs-und Verwertungsgesellschaft mbH, Graz, Austria

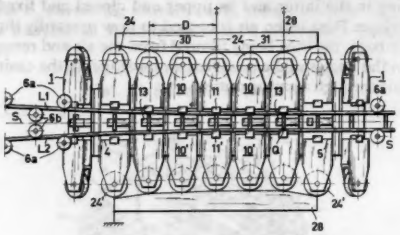
Filed Nov. 29, 1971, Ser. No. 202,935

Claims priority, application Austria, Nov. 27, 1970, A 10732/70

Int. Cl. B23k *11/02*

U.S. Cl. 219—56 **5 Claims**

Disclosed is an electric welding machine including an endless chain of welding heads, each head supporting opposite electrode holders for longitudinal rods and grippers for transverse rods, and cam means operable for controlling the operative and inoperative positions of the holders and grippers.



3,699,757

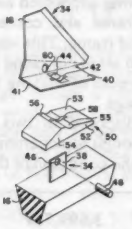
BELT CARRIED CUTTERS AND MOUNTING MEANS THEREFORE

Joseph C. Hulburt, Leola, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed March 23, 1971, Ser. No. 127,099

Int. Cl. A01d *55/24*

U.S. Cl. 56—291 **3 Claims**



An endless belt type cutter assembly for a mower having cutter blades of the impact type connected for swinging movement to outwardly projecting posts carried by the belt at spaced apart intervals. The connection means includes a pin adapted to pass through a hole in the post and to be received by a recessed seat in a portion of the cutter blade.

3,699,758

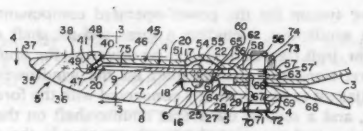
PRE-STRESSED TIE GUARD WITH KNIFE SECTION RETAINER

Thomas J. Scarnato, Barrington; Peter J. Peacock, Western Springs, and John J. Kowalik, Glenview, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Feb. 25, 1972, Ser. No. 229,449

Int. Cl. A01d *55/10*

U.S. Cl. 56—307 **11 Claims**



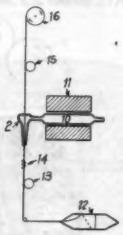
A sickle guard having separable upper and lower sections, the both sections, which are pre-stressed, oppose excessive lateral as well as longitudinal loads due to the guards striking obstructions or the sickle being deflected out of plane and striking the upper section. A novel wedging action is obtained between the sections which is conducive to a favorable destribution of the forces opposing destructive loads.

3,699,759

APPARATUS FOR CONVERTING TEXTILE THREADS

Michel S. M. Lefebvre, 41 Rue de Picardie, Saint-Quentin, France

Division of Ser. No. 697,812, Jan. 15, 1968, Pat. No. 3,534,453. This application June 18, 1970, Ser. No. 47,383
Claims priority, application France, March 24, 1967, 6718862
Int. Cl. D02g 1/16
U.S. Cl. 57—34 B 5 Claims



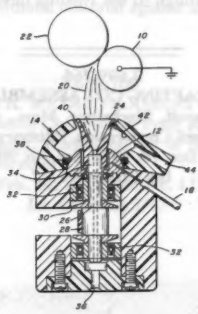
A conversion apparatus for textile thread in which the thread moves in hot gas subject to the action of shock waves which deform and fix the thread.

3,699,760

OPEN END ELECTROSTATIC SPINNING HEAD

Leo L. Chabot, Cumberland, R.I., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed April 19, 1971, Ser. No. 135,321
Int. Cl. D01h 1/12, 11/00
U.S. Cl. 57—58.89 8 Claims



An improved spinning head apparatus used in the performance of open end electrostatic spinning of fibers into yarn wherein internal rotating parts are maintained free of stray fiber buildup comprising a stationary housing having a throughbore therein and a hollow spindle for rotation within the throughbore. The spindle includes a fiber collecting funnel at one end. An electrode is mounted within the housing in a suitable position to electrostatically attract charged fibers to the collecting funnel. Means defining an opening in the housing connects the throughbore of the housing with the outside environment whereby the throughbore can be maintained free of stray fiber buildup.

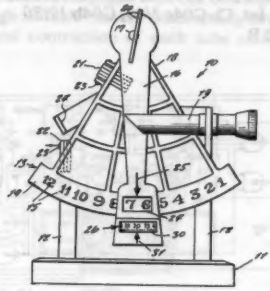
3,699,761

SEXTANT CLOCK

Edward D. Onstott, 413 Maplewood Drive, Colorado Springs, Colo.

Filed March 30, 1970, Ser. No. 23,760
Int. Cl. G04b 45/00, 19/20
U.S. Cl. 58—2 1 Claim

A time indicating clock incorporating a novel conventional clock design by elimination of a clock face upon a case, the device comprising a configuration of a nautical sextant and which includes numerals indicating hours along an arc and across which a pivoted arm sweeps, the arm selectively pointing out one of the hour numerals, and the arm carrying a minute indicating mechanism.

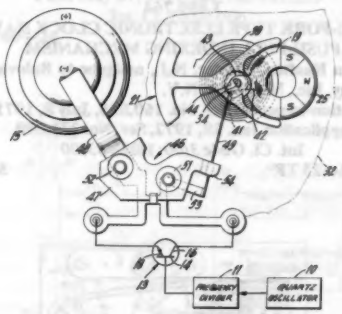


3,699,762

SYNCHRONIZED CONTACT WATCH

Norman Charles Zatsky, Briarcliff Manor, N.Y., assignor to Timex Corporation, Waterbury, Conn.

Filed April 5, 1971, Ser. No. 131,237
Int. Cl. G04c 3/00
U.S. Cl. 58—23 AC 10 Claims

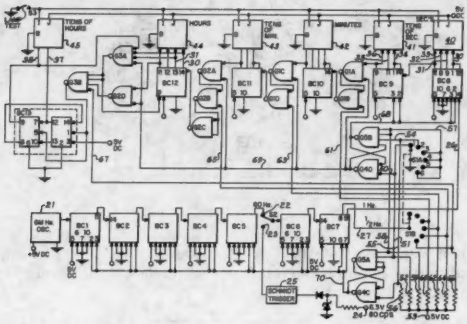


A battery-powered electric wrist watch in which a known fixed-frequency time base unit, such as that having a quartz oscillator and a frequency divider, is made operative to give better timekeeping by association in a simplified way with the motive unit of the watch through the use of a combination of selected particular functional units, viz., (1) the means for directly actuating the wheels of the watch is an oscillatory balance wheel assembly whose frequency of oscillation is made dependent on its oscillation amplitude over a working range of frequency values; (2) the impulsion of the balance wheel is by impulses from an electromagnetic motive unit of coil and permanent magnet whenever battery current flows in the drive coil; and (3), the flow of current in the drive coil, which is made to occur in intermittent pulses by a contactor associated in known fashion with the balance wheel, is controlled as to its duration (pulse width) and particular timing by the AND-function effect of the connection of the contactor and the battery in series with two terminals of a transistor whose control terminal receives a train of output pulses of fixed frequency directly from the frequency divider of the fixed-frequency time base unit, to make the transistor intermittently conductive for periods of fixed duration.

3,699,763
24-HOUR DIGITAL CLOCK

David L. Zeph, Indianapolis, Ind., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 6, 1971, Ser. No. 159,856
Int. Cl. G04c *3/00*; G04b *19/30*
U.S. Cl. 58—23 R 9 Claims

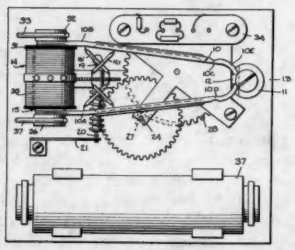


A 24-hour digital clock having a plurality of division counters driven from a stable frequency which are coupled to seven line segment decoder-drivers. A selector switch coupled to the counters allows setting of the minutes, tens of minutes, hours, and tens of hours to a precise time signal while resetting all other counters.

3,699,764
TUNING-FORK TYPE ELECTRONIC CLOCK HAVING PUSH-PULL INDEXING MECHANISM

Egbert Van Haaften, Closter, N.J., assignor to Bulova Watch Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 160,835, July 8, 1971. This application Jan. 28, 1972, Ser. No. 221,690
Int. Cl. G04c *3/00*; H02k *33/00*
U.S. Cl. 58—23 TF 5 Claims

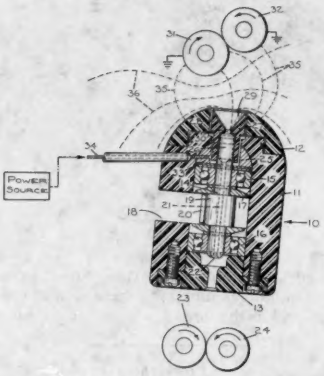


An electronic clock making use of an electromagnetically-actuated tuning fork whose vibrations are converted into rotary motion for driving the gear train of the clock. The conversion is effected by an indexing mechanism including two oppositely directed V-shaped indexing elements whose ends are attached to the tines of the fork. The vertex of each element is flattened to define a rectangular tongue whose edge engages the ratchet teeth of an index wheel whereby as the tines vibrate, the tongues reciprocate in phase opposition in a rectilinear path at right angles to the direction of vibration. In the course of each cycle, as the tines move together, one tongue acts to push the wheel as the other tongue retracts, and when the tines move away from each other, the other tongue acts to pull the wheel as the one tongue retracts.

3,699,765
ELECTROSTATIC SPINNING HEAD

Richard A. Amato, Bolton, Mass., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Nov. 10, 1970, Ser. No. 88,405
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.89 4 Claims

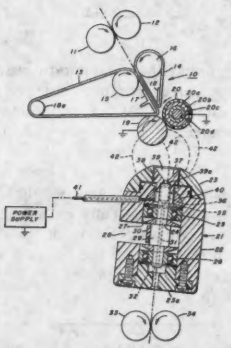


An improved spinning head for an electrostatic spinning apparatus including means for reinforcing and stabilizing the electrostatic field through which textile fibers are caused to travel so as to produce and maintain a desired flow path of said fibers therethrough to the twisting device carried within said spinning head.

3,699,766
DRAFTING COT ASSEMBLY

Roger J. Archambault, Blackstone, Mass., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Dec. 15, 1970, Ser. No. 98,371
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.91 2 Claims



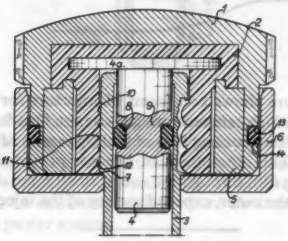
An improved drafting cot assembly for use in conjunction with an open end electrostatic spinning apparatus. The assembly is comprised of a rotatably mounted cot roll having rotary, fiber advancing surface and smooth, rounded shields adjacent the ends of the roll to prevent stray fiber accumulation adjacent the fiber advancing surface.

3,699,767

TIGHT CONTROL MEMBER FOR WATCH MOVEMENT

Ervin Piquerez, deceased, late of Bassecourt, Switzerland; Ami Scholler, 3 rue Hugi, Bienne, Switzerland, and Edouard Bandelier, executors, 10, Neubadrain, 4102 Binningen, Switzerland

Filed June 15, 1971, Ser. No. 153,178
Claims priority, application Switzerland, July 3, 1970, 10087/70
Int. Cl. G04b 37/08
U.S. Cl. 58—90 B 5 Claims



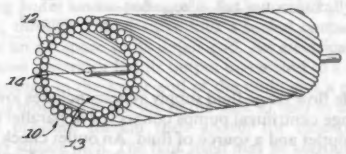
This fluid-tight mounting for a control member for a watch movement or like mechanism comprises a winding button having a member of synthetic material fitted therein, in which the flange-shaped head of a shank for driving the associated part is embedded. Rigid with the case of the mechanism is a socket having a bottom through which said shank extends towards the mechanism to be controlled. The socket receives in smooth frictional contact the skirt of said button with the interposition of an O-ring, thus permitting both rotational and axial sliding movements of said button therein and protecting said member of synthetic material against any attack from external agents.

3,699,768

ELASTIC METAL FILAMENT YARN

John A. Roberts, North Chelmsford; Peter R. Roberts, Groton, and James E. Kelly, Burlington, all of Mass., assignors to Brunswick Corporation

Filed Feb. 24, 1971, Ser. No. 118,320
Int. Cl. D02g 3/12
U.S. Cl. 57—144 12 Claims



An elastic metal filament yarn, compatible with any natural and/or synthetic filamentary yarn or composite material, consisting of a plurality of outer peripheral metal filaments and at least one central metal filament located along the axis of the filament yarn, where said outer filaments are helically twisted around the yarn axis defining a void therein, wherein the outer metal filaments will collapse toward the central filament when axial tension is applied to the yarn.

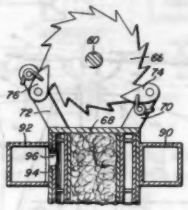
3,699,769

TEMPERATURE CHANGE ACTUATED MOTOR

John C. Bondurant, 219 East Clinton Street, Hickman, Ky.

Filed April 22, 1971, Ser. No. 136,395
Int. Cl. F03g 7/06
U.S. Cl. 60—23 12 Claims

A battery of side-by-side tubes constructed of a material having a high coefficient of expansion is provided and one set of ends of the tubes are stationarily supported from a suitable base. A power shaft is rotatably journalled on an axis stationary relative to the base and the shaft includes a ratchet wheel for each tube. Each tube has a pair of ratchet paws operatively associated therewith engaged with the corresponding ratchet wheel through suitable motion transmitting structure and the expansion and contraction of each tube above a predetermined magnitude is operative to rotate the shaft. A hot air manifold and a cold air manifold extend along one set of ends of the tubes and valve structure is provided for alternately communicating the interior of the manifolds with the interiors of the tubes, the valve structures being alternately driven through open and closed positions from the shaft and the remote ends of the tubes being provided with damper controlled air discharge structure.

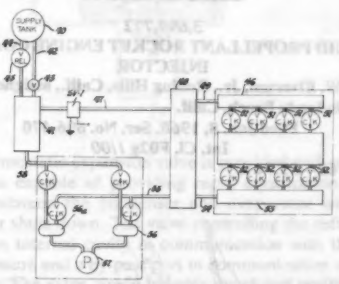


3,699,770

STIRLING ENGINE CONTROL SYSTEM

James E. Bennethum, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 27, 1971, Ser. No. 147,355
Int. Cl. F03g 7/06
U.S. Cl. 60—24 3 Claims



A working gas control system for a double acting hot gas engine particularly adapted for vehicle installation and including a manually adjustable system for variably controlling the pressure of the engine working gas to provide for load control of the engine. The system includes a gas reservoir for working gas to supply the engine system with gas at a suitable mean working pressure through an operator actuator control system. A gas supply tank is provided to maintain a predetermined minimum gas pressure in the reservoir.

3,699,771

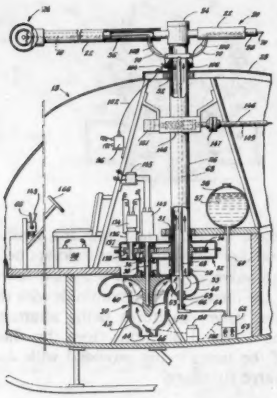
ROTARY WING AIRCRAFT LIFT AND PROPULSION METHOD AND SYSTEMS

Stephen V. Chelminski, West Redding, Conn., assignor to Kendall G. Parmelee, Riverside, Conn., a part interest

Filed Jan. 29, 1970, Ser. No. 6,693
Int. Cl. F02c 3/16
U.S. Cl. 60—39.35 4 Claims

A rotary wing aircraft lift and propulsion method and system in which burner thruster units mounted on the lift-producing rotor at a position spaced radially from the axis of

the rotor generate moments to turn the rotor about its axis. An air compressor is driven by the rotor through a speed increasing drive and pumps air at a pressure exceeding atmospheric through ducts in the rotor extending out to the respective burner thruster units while fuel is shock in them to produce jets reflecting combustion gases generating thrust to turn the rotor about its axis. In addition to the lift-producing rotor, a propeller serves to drive the aircraft forward or backward, and



the power for driving this propeller is derived from the rotation of the rotor itself. To control forward or backward motion of the craft, the propeller pitch is varied, and also it may be disengaged by use of a clutch. There is a forward-motion steering rudder and a downwash deflector rudder which are both operable by the same control for counteracting the moderate rotor torque exerted on the aircraft body and for steering the craft.

3,699,772

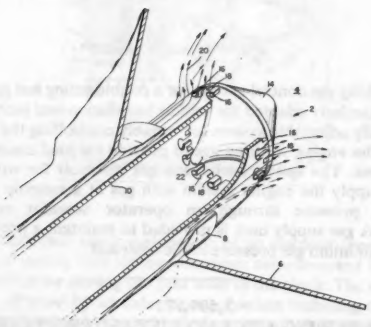
LIQUID PROPELLANT ROCKET ENGINE COAXIAL INJECTOR

Gerard W. Elverum, Jr., Rolling Hills, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jan. 8, 1968, Ser. No. 696,470

Int. Cl. F02g *1/00*

U.S. Cl. 60—39.74 A **1 Claim**



To provide combustion stability in rocket engines over a wide range of thrust, a coaxial injector is provided which includes an outer annular sleeve for introduction of one propellant and a hollow pintle with spaced slots for introduction of another propellant to impinge on the first propellant. The slots are staggered in location and size to permit initial interlocking of the propellants and, therefore, increased mixing and combustion performance.

3,699,773

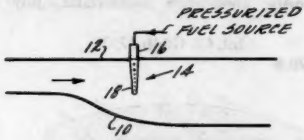
FUEL COOLED FUEL INJECTORS

Kenneth W. Schuning, and Eugene E. Carlson, both of Cincinnati, Ohio, assignors to General Electric Company

Filed Dec. 23, 1968, Ser. No. 786,146

Int. Cl. F02g *1/00*

U.S. Cl. 60—39.74 R **1 Claim**



The disclosure shows two forms of injectors for supplying fuel to an ultra high temperature gas stream. One form of fuel injector provides a cooling film of fuel by reason of its porous construction. The other form of injector provides the same type of cooling film through the use of small holes disposed at a low angle to the outer, exposed surface of the injector.

3,699,774

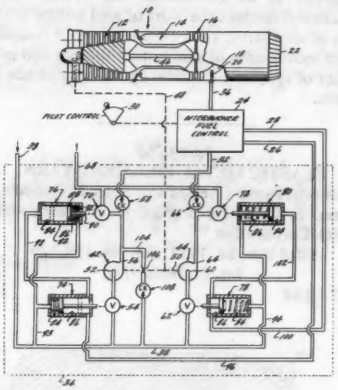
FLUID SUPPLY SYSTEM

Donald Y. Davis, and George A. Coffinberry, both of Cincinnati, Ohio, assignors to General Electric Company

Filed Sept. 17, 1970, Ser. No. 73,058

Int. Cl. F02c *9/06*

U.S. Cl. 60—39.28 **10 Claims**



A wide flow range fluid supply system includes low and high flow range centrifugal pumps connected in parallel between a system outlet and a source of fluid. An outlet check valve and an inlet valve are provided for each pump. Means are provided to recirculate a predetermined portion of the discharge flow from the outlet of the low range pump to enable both pumps to operate during high flow system operation without overheating the low range pump.

3,699,775

GAS AND LIQUID PROCESSING SYSTEM

Kenneth W. Cowans, Los Angeles, Calif., assignor to Sub-Marine Systems Incorporated

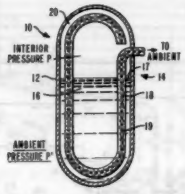
Filed Dec. 11, 1969, Ser. No. 884,151

Int. Cl. F17c *7/02*

U.S. Cl. 62—55 **14 Claims**

In a liquid processing system, a container includes a liquid and a pressurizing gas which is substantially non-reactive with respect to the liquid and establishes a controlled pressure differential between the interior of the container and its surroundings. A porous conduit, extending between the interior

and exterior of the container, is maintained in contact with the liquid. The conduit transports liquid along its length, forming a meniscus of extended surface upon portions of the conduit not submerged in the liquid. The meniscus defines a gas barrier; the conduit nevertheless transports fluid at a selected rate



between the container and its surroundings. When employed in a cryogenic system, fluid may be transported in response to heat interchange by the container, the rate depending on the temperature change required. The fluid further may be ejected into an extremely high pressure environment without the use of a power source.

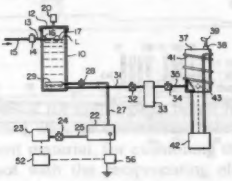
ERRATA

For Classes 60—52 HF thru 62—45 see:
Patents Nos. 3,699,675 thru 3,699,696

3,699,776
OZONE PURIFIER FOR PRESSURIZED WATER COOLER

Julius La Raus, Rochester, N.Y., assignor to Moody Aquamatic Systems, Inc., Meadville, Pa.

Filed June 30, 1971, Ser. No. 158,377
Int. Cl. F25d *23/00*
U.S. Cl. 62—157 **9 Claims**



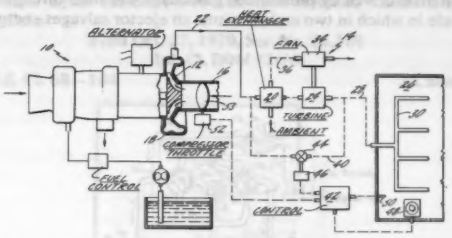
Drinking water under pressure is fed automatically, when necessary, through a float valve into a sealed contact tank, which has an air space in its upper end. An electrically controlled ozone generator has its output connected to a diffuser that is mounted in the lower end of the tank; and a pressure regulator is mounted in the top of the tank to vent its air space when the pressure therein rises above, for example, five pounds per square inch. The tank itself may be surrounded by a cooling coil, so as to function both as a contact and cooling tank, or its output may be connected to a second tank surrounded by a cooling coil. The ozone generator may be periodically energized by a timer, or by a thermostat which is responsive to the temperature of the water in the cooling tank.

3,699,777
CAPACITY CONTROL FOR GAS TURBINE POWERED AIR CYCLE REFRIGERATION SYSTEM

George C. Rannenberg, Canton, Conn., assignor to United Aircraft Corporation, Hartford, Conn.

Filed April 9, 1971, Ser. No. 132,837
Int. Cl. F25b *9/00*
U.S. Cl. 62—172 **8 Claims**

For a gas turbine powered air cycle refrigeration package which gas turbine is normally operated at a constant speed and is operatively connected to a compressor or fan for feeding air to the package. The quantity of air through the compressor or fan is regulated for conserving the energy of the power plant. The air flow through the compressor is regulated as a function

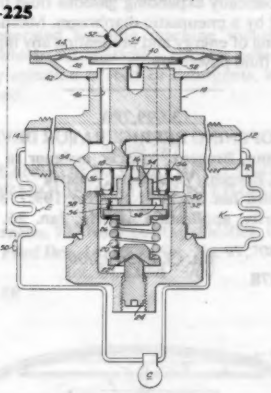


of an error signal between the desired and actual temperature produced by the air cycle refrigeration system.

3,699,778
THERMAL EXPANSION VALVE WITH RAPID PRESSURE EQUALIZER

Charles D. Orth, Cedarburg, Wis., assignor to Controls Company of America, Melrose Park, Ill.

Filed March 29, 1971, Ser. No. 128,977
Int. Cl. F25b *41/04*
U.S. Cl. 62—225 **6 Claims**



The thermostatic expansion valve is provided with an internal by-pass capable of providing rapid equalization of the pressure between the condenser and evaporator when the compressor shuts down. The valve controlling the refrigerant flow has an internal cavity in communication with the condenser pressure and a by-pass port in communication with the evaporator. The valve, urged towards the closed position by a spring, is actuated by the diaphragm through push pins. The push pins normally close the by-pass port, either by the lower end of one or more of the push pins cooperating with a seat located at the by-pass port outlet or a valve means (e.g. a flanged collar which guides the valve) interposed the push pins and the by-pass port. With the valve in the closed position, the push pin(s) or valve means can be lifted off the by-pass port by condenser pressure in the cavity, as forces across the diaphragm equalize after shutdown of the compressor. The system pressure is then rapidly equalized through the by-pass port.

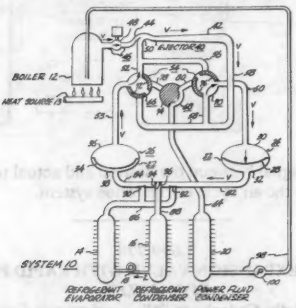
3,699,779
THERMALLY POWERED DIAPHRAGM PUMP SYSTEM FOR HEAT TRANSFER

Ralph C. Schlichtig, 11212 S. 3rd, Seattle, Wash.

Filed June 1, 1971, Ser. No. 148,723
Int. Cl. F25b *13/00*
U.S. Cl. 62—324 **18 Claims**

A pneumatic diaphragm pump system shown embodied in a thermally powered refrigeration system with means for heat

pumping with a high coefficient of performance while using any of several safe and non-toxic refrigerants. The pump system is driven by pressurized gaseous power fluid through a cycle in which in two embodiments an ejector salvages energy



from the adiabatically expanding gaseous fluid in a compartment bounded by a pneumatic diaphragm. Means is provided for cyclic storing of energy and preheating any liquid returned to the gaseous fluid power source.

3,699,780

TOP OPENING REFRIGERATOR DEVICE

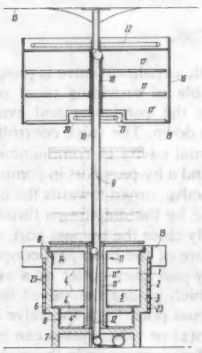
Hasso Gehrmann, Bregenz, Austria, assignor to Elektra-Bregenz GmbH, Bregenz/Vorarlberg, Austria

Filed Jan. 26, 1971, Ser. No. 109,775

Claims priority, application Austria, Jan. 26, 1970, 13 A 668/70

Int. Cl. F25d *25/00*

U.S. Cl. 62—378 **6 Claims**



A refrigerator is formed of a open-topped tank enclosed by heat insulating material and an exterior casing. The tank contains storage shelves and a cover closes its top opening. A vertically arranged support column is associated with the tank and, preferably, is positioned centrally of and extends upwardly out of the tank. Lifting means are incorporated into the support column for vertically displacing the cover and shelves of the tank. In a preferred arrangement the top of the tank is located at about table top level and additional storage shelves are positioned in a casing spaced above the tank. These storage shelves are movably mounted on the support column.

3,699,781

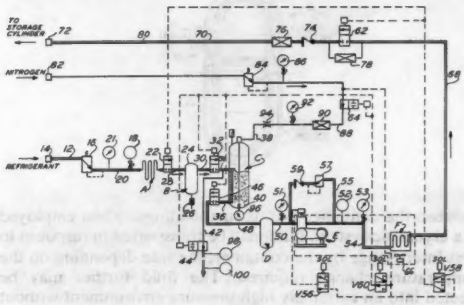
REFRIGERANT RECOVERY SYSTEM

Larry Christopher Taylor, Philadelphia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 27, 1971, Ser. No. 175,601

Int. Cl. F25b *43/04*

U.S. Cl. 62—474 **9 Claims**



Apparatus for recovery of halogenated hydrocarbon refrigerant from defective refrigeration and air conditioning systems removes entrained moisture, chlorides, oils and sludge so that the reclaimed refrigerant is restored to original specification purity standards.

3,699,782

KNITTING MACHINES, ESPECIALLY FLAT MACHINES

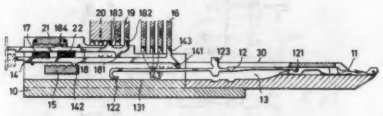
Wilhelm Hadam, Reuthlingen, Germany, assignor to H. Stoll and Company, Stollweg, Germany

Filed Dec. 15, 1970, Ser. No. 98,236

Claims priority, application Germany, Dec. 15, 1969, P 19 62 787.3

Int. Cl. D04b *7/00*

U.S. Cl. 66—75 **6 Claims**



In a flat knitting machine with needle-actuating jacks mounted in the needle bed tricks, each with a working or operating butt acted on by the needle cams or lock parts for control of the needle movements, each jack is made as an elastically flexible rod or bar supported at both ends, on which a presser element can act, and the working butt of each jack is disposed in the area of maximum bending, such that it is moved out of range of the cam parts when the jack is bent. The jack is coupled with its associated needle so that the needle does not have to have a working butt of its own and necessarily must follow the movement of the jack in the needle trick, in either direction. For bending the jacks, presser jacks can be provided, or there can be provided an articulated slide or pusher on a selector jack, the slide or pusher having a wedge-shaped end which cooperates with a stationary oblique surface.

3,699,783

APPARATUS FOR FEEDING FILLING THREADS TO A WARP KNITTING MACHINE

Alexander J. Carman, Athens, Ga., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

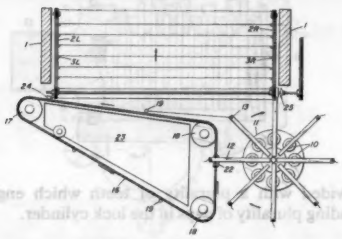
Filed Oct. 20, 1969, Ser. No. 867,524

Int. Cl. D04b *23/12*

U.S. Cl. 66—84 **1 Claim**

A feed mechanism for feeding lengths of weft thread on chains to a weft inserted warp knitting machine in which

threads from packages rotating on a turntable pass through arms for each package and are transferred to an auxiliary chain provided with clamping thread transfer pins which carry one end of each of the threads across the knitting machine to



the far weft carrier chain while the rotating arms carry the other ends to the near feeding chain. The weft thread thus strung across from chain to chain is clamped on the chain, and at the near feeding chain the thread is cut.

3,699,784

LATCH NEEDLE FOR KNITTING MACHINES

Hardo Berentzen, Ebingen/Wurttemberg, Germany, assignor to Theodore Groz & Sohne and Ernst Beckert Nadelfabrik Commandit-Gesselschaft, Ebingen/Wurttembert, Germany

Filed June 4, 1971, Ser. No. 149,969

Claims priority, application Germany, June 15, 1970, P 20 29 440.0

Int. Cl. D04b *35/02*

U.S. Cl. 66—123 **10 Claims**

A steel latch needle for knitting machines, having a needle foot which is coated with, or constructed wholly or partially of, shock-absorbent material, for cushioning the engagement of the needle foot with the reciprocating elements of the knitting machine during operation.

3,699,785

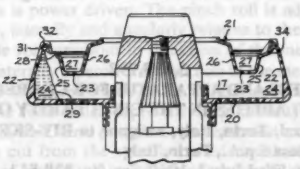
ADDITIVE DISPENSING ARRANGEMENT

Richard A. Waugh, Louisville, Ky., assignor to General Electric Company

Filed March 10, 1971, Ser. No. 122,926

Int. Cl. D06f *39/02*

U.S. Cl. 68—17 A **5 Claims**



An additive dispensing arrangement for a washing machine, including removably mounting the dispenser above the filter pan, whereby the peripheral wall of the filter pan is utilized as a holding means in transferring the additive from the dispenser to the clothes washing receptacle.

3,699,786

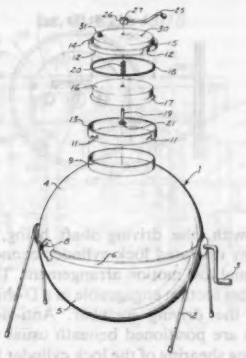
HAND OPERATED WASHING MACHINE

Joseph Lynn Rencher, 900 Harrison Avenue, Canon City, Colo.

Filed Oct. 27, 1970, Ser. No. 84,360

Int. Cl. D06f *37/10*

U.S. Cl. 68—144 **3 Claims**



A hand operated washing machine includes a closure mechanism which automatically releases internal pressure, developed by agitation of soap or detergents, before the closure is removed.

3,699,787

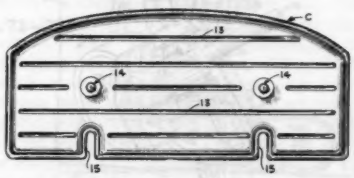
COVER MEANS FOR NAVIGATIONAL INSTRUMENTS AND RADIO EQUIPMENT MOUNTED ON PANEL OF AIRCRAFT

Ronald F. Corrado, 727 Noriegn Way, Pacifica, Calif.

Filed Dec. 14, 1970, Ser. No. 97,708

Int. Cl. E05d *73/00*

U.S. Cl. 70—58 **16 Claims**



A cover means for the navigational instruments and radio equipment of an aircraft that are mounted on and arranged for removal from the aft face of the instrument panel of such aircraft which cover means includes a cover provided with lock means that are arranged to coact with cooperating lock devices mounted on such aircraft instrument panel or other permanent structure of the aircraft so as to prevent removal of such cover from said panel and consequently access to the instruments and equipment mounted thereon and thereby preclude their unauthorized removal or theft.

3,699,788

LATCH CONSTRUCTION INCLUDING ASSEMBLY, ANTI-VIOLATION AND DEAD BOLT FEATURES

John R. Gerlach, Monterey Park, and Clarence B. Morrensen, Orange, both of Calif., assignors to Emhart Corporation, Bloomfield, Conn.

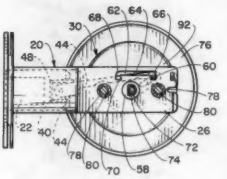
Filed Feb. 12, 1971, Ser. No. 114,991

Int. Cl. E05b *9/04*; E05c *1/06*

U.S. Cl. 70—134 **20 Claims**

A bolt is moved by a driving lever pivoted on the bolt and through a transverse pin to a slotted rotatable driving member,

the driving lever pin being guided in movement in the driving member slot by extension thereof transversely through an inverted U-shaped guide slot in the latch frame. The forward downward end portion of the guide slot is rearwardly undercut in its downward extension. The operating lever is rotatable through a transverse driving shaft transversely slidably engaged therewith, the driving shaft being, in turn, rotated through a key operated lock cylinder connected to the shaft through a usual lost motion arrangement. The driving shaft is D-shaped cross section engageable in a D-shaped cross section opening of the driving member. Anti-violation plates of unique form are positioned beneath usual rosette and cover plates resisting shearing of the lock cylinder frame.



3,699,789

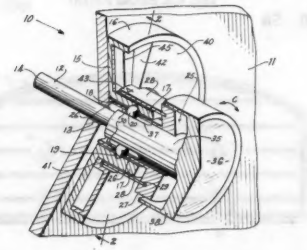
DIAL STRUCTURE FOR MECHANISM REQUIRING BOTH LINEAL AND ROTARY INPUT OPERATING MOVEMENTS

Anthony J. Potzick, Cincinnati, Ohio, assignor to The Mosler Safe Company, Hamilton, Ohio

Filed June 28, 1971, Ser. No. 157,405

Int. Cl. E05b *15/00*

U.S. Cl. 70—329 **15 Claims**



Dial structure for use with a lock or other mechanism which requires both rotary and axial input movements of an operating spindle. The structure includes an operating knob for imparting both such movements to the spindle, and a dial having position indicia and which is responsive to and follows rotary movement but not lineal movement of the knob. Other features include a bearing connection which provides a universal joint of the spindle in the dial frame, to accommodate minor misalignment of the dial structure with respect to the mechanism. A mask screens all position indicia except that in a narrow aperture, which is visible only to the operator.

3,699,790

CYLINDER LOCK

Vaino Toivo Ansala, Jatasalmentie, Helsinki 83, Finland

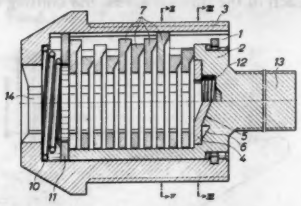
Filed April 5, 1971, Ser. No. 131,256

Claims priority, application Finland, Sept. 8, 1970, 2472

Int. Cl. E05b *21/06*

U.S. Cl. 70—364 R **4 Claims**

A pick-proof cylinder lock whose cylinder may rotate in either direction, for example, to unscrew the lock from a threaded recess in a vending machine. The lock includes a locking disc mounted at one end of the detent stack. The disc is provided with a plurality of teeth which engage a corresponding plurality of gaps in the lock cylinder.



3,699,791

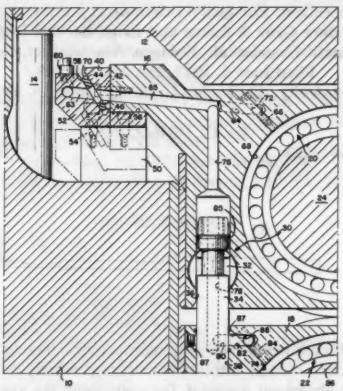
WORK ROLL BEARING LUBRICATION ARRANGEMENT

Werner W. Eibe, Pittsburgh, Pa., assignor to Blaw-Knox Foundry & Mill Machinery, Inc., Pittsburgh, Pa.

Filed June 28, 1971, Ser. No. 157,453

Int. Cl. B21b *45/02, 27/06*

U.S. Cl. 72—45 **10 Claims**



A hoseless lubrication arrangement for the work rolls of a rolling mill including a pair of cooperating wall portions on an adapter on the balancing piston and on an adapter on the work roll chock, the wall portions being in opposed relation when the work roll chock is supported on the balancing piston within the mill housing. A lubrication passage extends from a supply fitting on the adapter on the balancing piston through the same and across the wall portions which are sealed and through the work roll chock into communication with the work roll bearing therein. The lubrication passage is automatically disconnected from the position interconnecting the fitting and the bearing when the work roll chock is removed from the mill housing and is automatically reconnected when a work roll chock is installed in the mill housing on the balancing piston.

3,699,792

PROCESS AND APPARATUS FOR CORRECTING IRREGULARITIES IN THE CIRCULARITY OF RINGS

Paolo Pettazzi, Turin, Italy, assignor to RIV-SKF Officine de Villar Petosa S.p.A., Turin, Italy

Filed July 3, 1969, Ser. No. 838,813

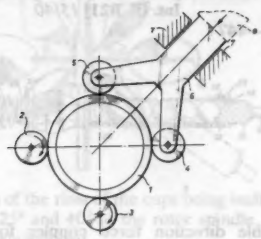
Claims priority, application Italy, July 11, 1968, 52399 A/68

Int. Cl. B21h *1/06*

U.S. Cl. 72—110 **3 Claims**

A body such as a bearing race ring having a cylindrical outer surface is prevented from deforming during chilling to harden

the body by rotating the body about its axis and engaging the outer surface of the body with at least two pressure rollers at two positions spaced circumferentially by 90° with respect to



the center of the body. The load applied by the rollers may be increased progressively during chilling, or applied sharply after an initial period of free chilling of the body.

3,699,793

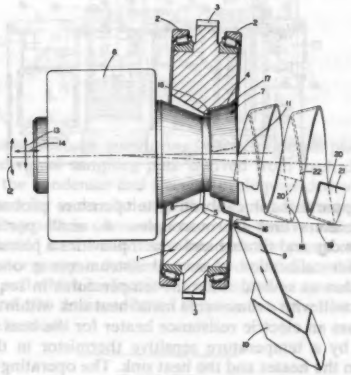
APPARATUS FOR FORMING ROLLER BEARING CAGES

William S. Wagner, 4945 Navarre Road, S. W., Canton, Ohio

Filed Oct. 19, 1970, Ser. No. 81,840

Int. Cl. B21c *47/00*; B21d *53/12*

U.S. Cl. 72—134 **3 Claims**



Apparatus for forming roller bearing cages from an elongated strip of metal of uniform thickness by passing the strip between a hollow roll mounted in fixed bearings and an adjustably mounted pinch roll located therethrough. At least one of the rolls is power driven. The pinch roll is adjustable longitudinally, laterally and angularly relative to the fixed roll to compensate for variations in thickness of the metal strip and to form a laterally tapered cross-section in the metal strip. The metal strip is guided through an adjustably mounted stock guide to the rolls which taper the strip laterally and bend it into a spiral coil. One at a time, the endmost complete convolution is cut from the spirally coiled metal strip, the ends thereof are brought into alignment with each other and welded. Slots for the bearing rollers may be cut out of the cage at this time, or may be cut out of the metal strip before it is passed through the apparatus. In a modified form of the apparatus, the metal strip is furnished in lengths suitable for forming a single cage instead of being formed into a spiral coil and then cut apart to form a plurality of cages.

3,699,794

UNIVERSAL ROLLING MILL STAND HAVING MORE THAN ONE CALIBER FOR ROLLING PROFILES BEAMS SUCH AS I-BEAMS

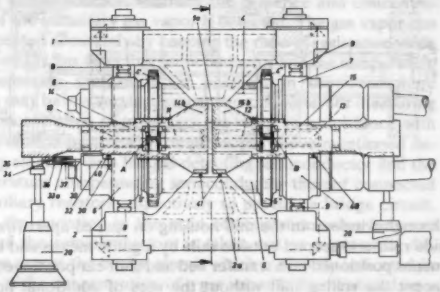
Otto Karl Buchheit, St. Ingbert, Saar, Germany, assignor to Moeller & Newmann GmbH, Ensheimer Str., Germany

Filed Sept. 8, 1970, Ser. No. 70,364

Claims priority, application Germany, Sept. 13, 1969, P 19 46 547.9

Int. Cl. B21b *13/10*

U.S. Cl. 72—225 **12 Claims**



A universal rolling mill stand for reversing rolling of profiled material such as I-beams has at least two calibers which are formed by an adjustable pair of horizontal rolls and at least two pairs of vertical rolls. At least one of the pairs of vertical rolls is adjustable by power-operated means between passes, and for this purpose the rolls are mounted in an intermediate frame in which at least one roll is displaceable and which is displaceable in the stand. Edging rolls may be incorporated in the stand.

3,699,795

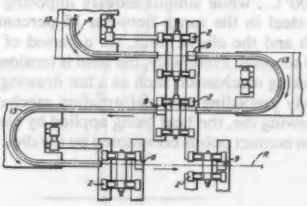
WORK TWISTER FOR ROLLING MILL

Arthur F. Pilling, Torrance, Calif., assignor to United States Steel Corporation

Filed Dec. 7, 1970, Ser. No. 95,471

Int. Cl. B21b *41/02*

U.S. Cl. 72—231 **4 Claims**



Described is apparatus adapted to be mounted on the delivery side of a rolling mill stand to receive an elongated piece of work, such as metal rod, being delivered from the mill stand and apply twisting force whereby the work enters the next stand rotated 90° as respects its passage into the preceding or delivering stand.

3,699,796

WORK ROLL CHANGERS

Werner W. Eibe, McCandless Twp., Allegheny County, and Wilfred T. Farrell, Robinson Twp., Allegheny County, Pa., assignors to Blaw-Knox Company

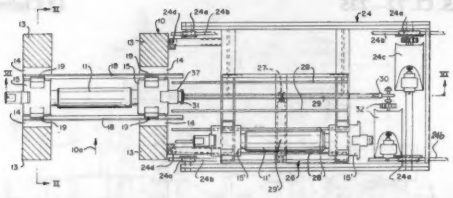
Filed Nov. 30, 1970, Ser. No. 93,727

Int. Cl. B21b *31/08*

U.S. Cl. 72—239 **18 Claims**

In a rolling mill the improvement of a roll changer for rapidly changing from one set of work rolls to another auto-

matically. The work rolls (and chocks) are raised and lowered on spaced apart first inside rails contacting the chocks supporting the upper work roll from operating position to transfer position in the mill housing spaced from each other so that they independently seek a predetermined drive position, preferably by the balancing means of the rolling mill. The work rolls are removed from and inserted into the rolling mill



through windows in the mill housing on spaced apart first inside rails and second outside rails by a guide means and latch means positioned on a transfer bed and shift car positioned adjacent the rolling mill without the uses of additional power means to connect and disconnect the latch means to and from the work rolls. The transfer bed may be movable to raise and lower the work rolls from floor level to transfer level.

3,699,797

HOT WORKED STEEL METHOD AND PRODUCT

Willy Tournoy, St. Lodewijk-Deerlijk, Belgium, assignor to N. V. Bekaert S.A., Zwevegem, Belgium

Filed Dec. 7, 1970, Ser. No. 95,928

Int. Cl. B21c *9/00*

U.S. Cl. 72—286 **7 Claims**

Hot worked medium carbon steel wire, strip or bar is given a high elastic limit, good workability, freedom from surface tensile stresses, good stress corrosion resistance and low creep, by heating the steel prior to hot working, to a temperature such that the temperature immediately after hot working is 350°–500°C., while simultaneously imposing tension on the heated steel in the range between 15 percent of the tensile strength and the elastic limit, for a period of time not more than 10 seconds. Preferably, the steel is tensioned between the hot working mechanism such as a hot drawing die and an immediately preceding cold deformation mechanism such as a cold drawing die, the heat being applied by electric resistance between contact points constituted by the dies.

3,699,798

METHOD OF INCREASING BERYLLIUM DUCTILITY

Raymond H. Anderson, Jr., Santa Ana, and Bennett V. Whiteson, Granada Hills, both of Calif., assignors to McDonnell Douglas Corporation

Filed Dec. 24, 1970, Ser. No. 101,257

Int. Cl. C21d *7/00;* **B21d** *26/08*

U.S. Cl. 72—377 . . . . . **6 Claims**

Reorienting by planar compression loading the atomic planes of deformation in a hexagonal close-packed unit cell of a metal crystal, and in particular beryllium, to improve ductility in a bending mode. In particular ductility in the third dimension (short transverse direction) is accomplished by reorientation of existing slip systems by activating twin systems through planar compression loads. Highly textured sheet material, usually cross-rolled from hot pressed block, is of particular interest.

3,699,799

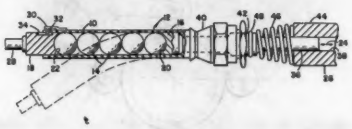
VARIABLE DIRECTION FORCE COUPLER

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and William H. Hespenhide

Filed Aug. 28, 1970, Ser. No. 67,730

Int. Cl. B21j *15/40*

U.S. Cl. 72—447 **4 Claims**



A variable direction force coupler for transmitting a reciprocating force along a selectable curved path consisting of a flexible tube filled with rigid balls and including force transmission members at each end adapted to connect the coupler between an applied force and a body to receive the force.

3,699,800

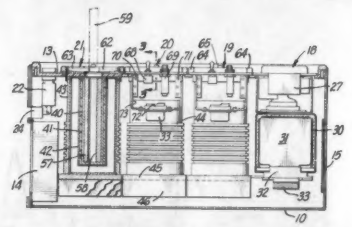
TEMPERATURE CALIBRATION SYSTEM

Bradley C. Waldron, Los Angeles, Calif., assignor to King Nutronics Corporation, Van Nuys, Calif.

Filed March 4, 1971, Ser. No. 120,818

Int. Cl. G01k *15/00*

U.S. Cl. 73—1 F **10 Claims**



An apparatus for calibrating temperature probes such as thermometers and thermocouples. A small portable unit which is dry and tiltable and which provides a plurality of set points for calibration of several instruments at one time or calibration at several different temperatures in sequence. A plug-in well with a removable metal heat sink within a vacuum bottle has an electric resistance heater for the heat sink controlled by a temperature sensitive thermistor in the sleeve between the heater and the heat sink. The operating temperature of each well may be preset ad may be adjusted as desired. A readout circuit operating from another temperature sensitive thermistor in the sleeve provides a direct indication of well temperature throughout the temperature operating range. The readout circuit provides an expanded scale indication of temperature and compensates for the highly nonlinear temperature characteristic of the thermistor.

3,699,801

ANEMOMETER ROTORS

John Ivor Parry Jones, Salisbury, England, assignor to The Secretary of State for Defence in her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, Whitehall, London, England

Filed Sept. 21, 1971, Ser. No. 182,396

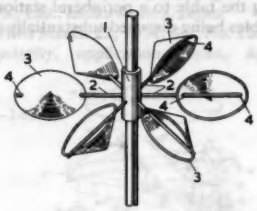
Claims priority, application Great Britain, Sept. 24, 1970, 45,514/70

Int. Cl. G01w *1/10*

U.S. Cl. 73—189 **5 Claims**

An anemometer rotor capable of maintaining to a high order of accuracy a linear relationship of rotational speed to

horizontal wind velocity by having an even number of lightweight cups, preferably six, disposed around the rotor



spindle, the planes of the rims of the cups being inclined at an angle of between 25° and 40° to the rotor spindle, alternate cups being oppositely inclined.

3,699,802

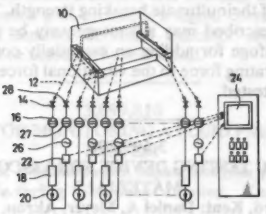
CONDENSER LEAKAGE MONITORING SYSTEM

Takeshi Hotta, and Hisashige Ishikawa, both of c/o Nikkiso Co., Ltd. No. 43-2, Ebisu 3-chome, Shibuya-ku, Tokyo, Japan

Filed Feb. 17, 1971, Ser. No. 116,024

Int. Cl. G01m *3/18, 3/22*

U.S. Cl. 73—40.5 R **2 Claims**



A condenser leakage monitoring system for power plants including individual sampling path derived from each divided section of the condenser and a sealed cycle provided within a vacuum zone for recirculation of the sample after inspection. The sampling path is connected to an inlet valve which is in turn connected to a sealed or canned motor pump and the canned motor pump is further connected to the conductivity measuring cell which is electrically connected to a conductivity meter and also communicated to an outlet valve through a detecting electrode.

3,699,803

SEMICONDUCTOR ELEMENT FOR DETECTING GASES AND METER FOR MEASURING COMPONENT CONCENTRATION OF A GAS MIXTURE

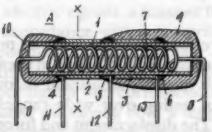
Kiyoshi Sumi, Kyoto, and Naomasa Sunano, Ayabe, both of Japan, assignors to Shiney Co., Kobe, Japan

Filed July 20, 1971, Ser. No. 164,331

Claims priority, application Japan, July 21, 1970, 45/64064

Int. Cl. G01n *27/12*

U.S. Cl. 73—27 R **10 Claims**



A gas vapor detecting element comprises an alumina ceramic cylinder with a coil-like heater extending through the interior thereof, and a gas detecting semiconductor and a temperature compensating semiconductor made of the same oxide semiconductor material and fixedly provided by sintering around the outer peripheral surface of the cylinder in adjacent relationship to each other. The opposite open ends of the ceramic cylinder are sealed with a glass material and the temperature compensating semiconductor is also covered and enclosed with the glass material. Contact of the detecting element with an atmosphere of insanitary gas vapor produces a variation in the ratio of resistance value between the gas detecting semiconductor and the enclosed temperature compensating semiconductor, whereby the presence and concentration of the insanitary gas vapor is detected. The gas vapor can be detected accurately by keeping the ratio of resistance value between the gas detecting semiconductor and the temperature compensating semiconductor constant in the atmosphere which may have a varying temperature. A meter for measuring the concentration of insanitary gas vapor in accordance with this invention principally comprises the above-mentioned detecting element, with the gas detecting semiconductor and the temperature compensating semiconductor thereof connected to auxiliary resistors respectively to provide a bridge circuit. Thus, the variation in the ratio of resistance value between both of the semiconductors is taken out as a potential difference across the bridge circuit which is directly indicated in terms of the concentration of a gas vapor to be measured on a potentiometer provided with a concentration scale.

3,699,804

CAPILLARY VISCOMETER

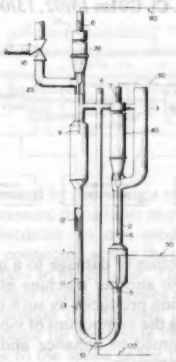
Hans Ulrich Gassmann, Fribourg, and Michel Mugnier, Monthey, both of Switzerland, assignors to Ciba-Geigy AG, Basle, Switzerland

Filed Jan. 20, 1971, Ser. No. 107,942

Claims priority, application Switzerland, Jan. 22, 1970, 894/70

Int. Cl. G01n *11/06*

U.S. Cl. 73—55 **15 Claims**



A capillary viscometer has a capillary in one arm of a U-tube. The other arm contains a pair of coaxial but axially spaced measuring electrodes the upper one of which is axially adjustable. A reference electrode is mounted in the base of the U-tube and an axially adjustable control electrode is disposed beyond the upper end of the capillary. A measured quantity of a test liquid is introduced into the measuring electrode arm and drawn up into the capillary arm by vacuum applied at the upper end of the capillary until the liquid contacts the control electrode. Upon the liquid now being allowed to flow back up the measuring electrode arm, the flow path including the capillary, contact of the leading liquid meniscus with the lower and upper measuring electrode respectively starts and stops a clock. The time measured is a function of viscosity. The adjustable measuring electrode allows the viscometer to be calibrated to a known standard. There is described a pneu-

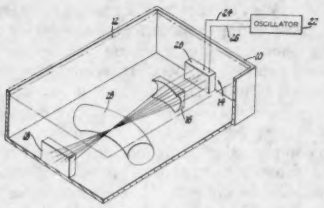
matic system whereby the operations in measurement are performed and an electric control circuit which enables measurements to be made substantially automatically.

3,699,805

ULTRASONIC TESTING APPARATUS

Willard W. Bayre, Amherst, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed July 26, 1968, Ser. No. 747,942
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.6 **6 Claims**



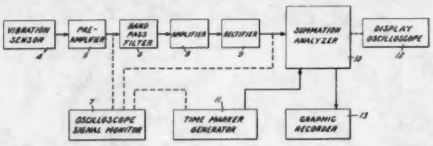
An ultrasonic testing apparatus including an ultrasonic lens having a double curved focusing face defined by two different constant curvatures each extending along a different one of two perpendicular reference axes so that each of the ultrasonic energy rays or wave trains in an ultrasonic beam passing through the focusing face is deflected at a different angle along each of the reference axes.

3,699,806

EARLY DETECTION OF DAMAGE TO MACHINE ELEMENTS IN ROLLING ENGAGEMENT

Bjorn Weichbrodt, 1038 Mahegan Road, Schenectady, N.Y.

Continuation-in-part of Ser. No. 653,509, July 14, 1967, abandoned. This application March 27, 1970, Ser. No. 23,252
Int. Cl. G01m *13/02, 13/04*
U.S. Cl. 73—71.4 **8 Claims**



A system for detection of damage to a machine element in rolling engagement to another machine element utilizing the component of vibration produced by such damage. Successive cycles each including the component of vibration produced by the damage are summed to enhance and render detectable such component of vibration.

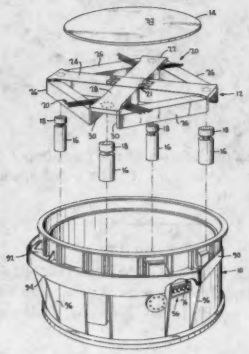
3,699,807

APPARATUS FOR VIBRATIONAL TESTING OF ARTICLES

James J. Kerley, Jr., Cheverly, and Norman C. Schaller, Seabrook, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Aug. 3, 1971, Ser. No. 168,650
Int. Cl. B06b *1/00*
U.S. Cl. 73—71.6 **20 Claims**

An apparatus for vibrational testing of manufactured assemblies, components, etc., comprising a vibration table having a generally planar supporting surface for the article being tested, at least a pair of actuating pistons for effecting vibrational movement of the table along a primary axis generally perpendicular to the plane of the supporting surface, at least one further actuating piston for effecting transverse vibration of the table generally in the plane of the supporting surface, and a plurality of pairs of prestressed supporting cables supportingly securing the table to a peripheral stationary frame, the supporting cables being disposed substantially in the plane



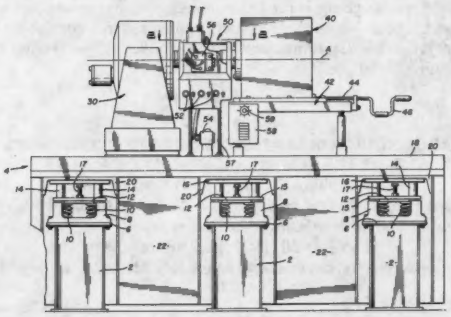
of the supporting surface and being pre-tensioned to at least ten percent of their ultimate breaking strength. The testing apparatus as described may advantageously be mounted on a testing centrifuge for adding an essentially constant gravitational accelerating force to the vibrational forces acting on the article being tested.

3,699,808

DYNAMIC TESTING DEVICE FOR VISCO-ELASTIC MATERIALS

Bryce W. Ford, Kent; Daniel A. Meyer, Akron, and Walter C. Warner, Hudson, all of Ohio, assignors to The General Tire & Rubber Company

Filed Oct. 13, 1971, Ser. No. 188,920
Int. Cl. G01n *3/38*
U.S. Cl. 73—91 **10 Claims**

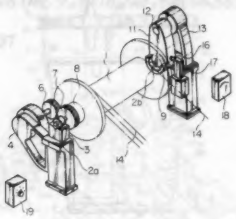


A testing device for obtaining dynamic properties of visco-elastic materials is adapted for testing in shear or compression. The device which imposes sinusoidal deformation upon the specimen permits testing over wide ranges of temperatures and frequencies. The displacement and force developed in the specimen are sensed by suitable transducers and with the aid of appropriate controls and instrumentation, the total or complex modulus of the material is found along with its "loss" or phase angle.

3,699,809
APPARATUS FOR DETECTING THE TENSION OF YARNS DELIVERED FROM A ROTARY YARN BEAM

Tokuji Komatsu, Kanazawa, Japan, assignor to Tsudakoma Industrial Co., Ltd., Ishikawa-ken, Japan

Filed March 22, 1971, Ser. No. 126,489
Claims priority, application Japan, April 16, 1970, 45/37030
Int. Cl. G01l 5/10
U.S. Cl. 73—143 6 Claims

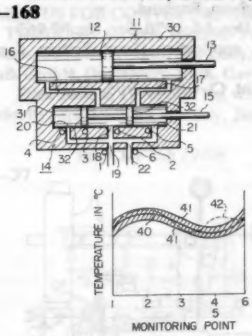


An apparatus for detecting the tension of yarns delivered from a rotary yarn beam that is movably supported at one end and supported for rotative movement on a pivotal arm at the other end. The tension of the yarn causes the pivotal movement of the arm which contacts and actuates an adjacently positioned detector that produces a signal corresponding to the amount of tension. A visual indicator and a braking mechanism can be actuated by this signal.

3,699,810
DEVICE FOR MONITORING A FLUID PRESSURE SYSTEM

Senji Takahashi, Yokohama-shi, Japan, assignor to Japan Aircraft Manufacturing Company Limited, Kanagawa-ken, Japan

Filed July 16, 1970, Ser. No. 55,367
Claims priority, application Japan, April 21, 1970, 45/33485
Int. Cl. G01k 7/00; G01m 19/00
U.S. Cl. 73—168 5 Claims

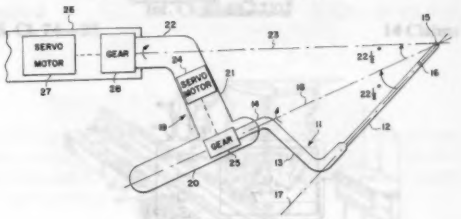


A device for monitoring a fluid pressure system comprises a plurality of tranducers for individually detecting local temperatures at a plurality of locations in the system and providing corresponding electric signals, a scanner for addressing the electric signals in accordance with a prescribed program and providing corresponding output signals, a linearizer for calibrating the output signals, an AD converter for converting the calibrated output signals into corresponding digital signals, and means for visually displaying both a temperature characteristic pattern developed from the digital signals and a temperature reference pattern indicative of the acceptable temperature levels in the system whereby a comparison of the two patterns may be made to determine defective components in the fluid pressure system.

3,699,811
FLOW VELOCITY AND DIRECTION INSTRUMENT

Donald L. Maiden, Williamsburg; James H. Monteith, Newport News, and Thomas D. Carpini, Hampton, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed July 27, 1971, Ser. No. 166,541
Int. Cl. G01m 9/00
U.S. Cl. 73—189 7 Claims

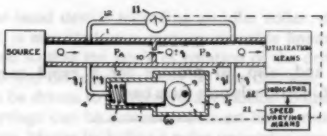


An instrument for providing measurements of both the magnitude and direction of flow velocities in a flow field. A probe is oriented in the flow field by two servo systems which impart two angular motions to the probe to aline it with the direction of the flow. The two angular motions are indicative of the direction of flow and the magnitude of the flow velocity is then measured by conventional means.

3,699,812
MASS FLOWMETER

Walter Masnik, 11 Cecil Court, Cedar Grove, N.J.

Filed Jan. 29, 1971, Ser. No. 110,839
Int. Cl. G01f 1/00
U.S. Cl. 73—205 D 9 Claims



Mass flow is measured by providing a restrictor in a conduit and a differential pressure transducer to measure the pressure drop across the restrictor. In one modification a variable speed piston pump connected across the restrictor alternately adds and subtracts flow to the conduit. The speed of the pump is responsive to changes from a reference pressure drop across the restrictor to maintain the pressure differential constant across the flow restrictor for changes in the mass flow rate. An indicator responsive to the speed of the pump serves to measure the mass flow rate which is inversely proportional to the speed of the pump. In a second modification like results are obtained by oscillating the restrictor in an axial direction instead of using a pump.

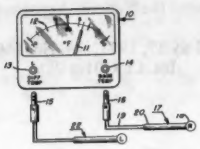
3,699,813
MEDICAL THERMOGRAPHIC DIAGNOSTIC MEANS

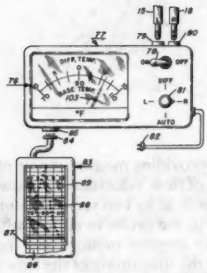
Anthony H. Lamb, 66 King Street, Hillside, N.J.

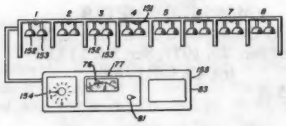
Filed May 25, 1970, Ser. No. 40,094
Int. Cl. G01k 7/24
U.S. Cl. 73—342 11 Claims

Temperature-sensitive elements, adapted for contact with selected areas of the human body, are connectable into a bridge circuit and effect the actuation of an indicator having a scale calibrated in predetermined temperature values. Circuit arrangements are provided for measuring and recording the temperature of individual temperature sensitive elements and

the temperature difference between such elements, thereby to facilitate obtaining diagnostic temperature information of an







individual and, also, to provide for a rapid temperature checking of individuals on a mass basis.

3,699,814

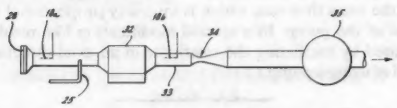
GAS SAMPLER

Warren F. Kaufman, Santa Ana, Calif., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed March 9, 1972, Ser. No. 233,082

Int. Cl. G01n 1/22

U.S. Cl. 73—421.5 **10 Claims**



Apparatus for sampling gaseous exhaust emissions, on a constant flow basis. A centrifugal type extractor pump is used to draw gas through a critical flow venturi of predetermined flow rate. Exhaust emissions are diluted with air and the critical flow venturi acts as a constant volume flow device serving a metering function. Samples are taken and collected continuously during the test run, and are available to be analyzed for contaminants such for example as hydrocarbon, carbon monoxide and oxides of nitrogen.

3,699,815

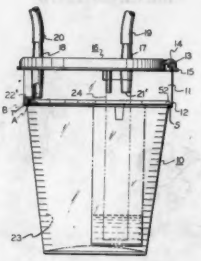
IMPROVEMENTS IN BODY FLUID COLLECTION BOTTLE

Legrand K. Holbrook, Salt Lake City, Utah, assignor to Medical Development Corporation, Salt Lake City, Utah

Filed Oct. 29, 1970, Ser. No. 85,075

Int. Cl. G01f 19/00; A61b 5/00

U.S. Cl. 73—427 **9 Claims**



A vacuum operated body fluid collection bottle having an insert container of receptacle which is calibrated to receive accurately measurable, small quantities of body fluid collected within the bottle. Such insert includes overflow means whereby quantities in excess of a predetermined amount can overflow into the interior of the outside container. The insert container, in a preferred form of the invention, is positioned by means of a flange disposed against a shoulder provided within the interior of the bottle. Both outside and interior containers are uniquely calibrated to satisfy a variety of conditions. An anti-splash tube is incorporated and uniquely positioned within the bottle construction and is appropriately spaced from the lid thereof to provide for a free exhaust of air and hence a creation of reduced pressure conditions proximate the liquid inlet of the bottle.

3,699,816

GOVERNOR MECHANISMS

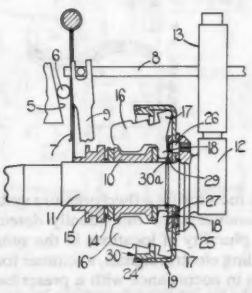
Pierre Henri Peltret, London, England, assignor to C.A.V. Limited, Birmingham, England

Filed Dec. 14, 1970, Ser. No. 97,963

Claims priority, application Great Britain, Jan. 1, 1970, 108/70

Int. Cl. G05d 13/06, 13/14

U.S. Cl. 73—526 **5 Claims**



A governor mechanism including a plurality of weights which are movable under the action of centrifugal force to urge a sleeve in one axial direction, the weights being located within a housing. The housing includes a cup shaped member in which is located an insert. The insert defines surfaces which guide the movement of the weights under the action of centrifugal force.

ERRATUM

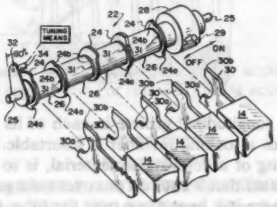
For Class 73—432 R see:
Patent No. 3,699,821

3,699,817

ISOLATOR WASHER MEANS FOR PUSHBUTTON TUNER MEMORY MECHANISM

Ole K. Nilssen, Barrington Hills, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 9, 1970, Ser. No. 96,553
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.37 **3 Claims**



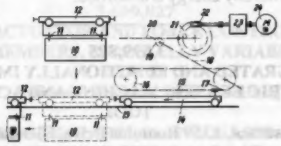
An isolator washer for a mechanical memory mechanism for a radio tuner or the like having a plurality of memory cams positioned at axially spaced locations in a common shaft. The shaft is rotated by actuation of a pushbutton which has a portion thereof engaging one of the memory cams to tune the radio to a desired preselected radio station. A common lock mechanism is used to simultaneously unlock all the memory cams on the shaft to a minimum per load holding force, and isolator washer means is positioned next to each memory cam to prevent rotational movement of a memory cam then being set from inadvertently rotating an adjacent memory cam which is not to be moved. The memory cam so being set is moved only under the influence of a setting action by its associated pushbutton.

3,699,818

APPARATUS FOR CONVEYING GLASS PANES THROUGH A PROCESSING PLANT

Kurt Klotzbach, Dusseldorf-Rath, Germany, assignor to SACK Glastechnik GmbH, Dusseldorg-Rath, Germany

Filed June 4, 1970, Ser. No. 43,353
Claims priority, application Germany, June 13, 1969, P 19 30 081.3
Int. Cl. F16h *19/06*
U.S. Cl. 74—37 **5 Claims**



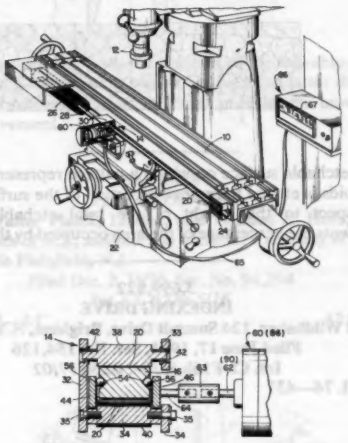
Apparatus for producing a jerk-free intermittent conveying motion which proceeds in accordance with a desired law of motion includes an electric motor driving the input of a steplessly variable transmission the output of which drives a crank transmission through a wormgear. A toothed push rod connected to the crank of the crank transmission drives a pinion coupled to drive one of two sprocket wheels carrying an endless chain to which is attached a carriage to be reciprocated. A cam disposed on the shaft of the crank has a control surface which defines the desired law of motion and is followed by a roller carried by one arm of a lever pivoted intermediate its ends. The other arm of the lever is coupled to an adjusting element of the steplessly variable transmission so as to adjust the output speed of such transmission in dependence upon the crank position and in accordance with the desired law of motion.

3,699,819

PRECISION LINEAR MOTION CONVERTING AND POSITION MEASURING APPARATUS

Seymour Mermelstein, Newton, Mass., assignor to Tyco Laboratories, Inc., Waltham, Mass.

Filed Aug. 6, 1970, Ser. No. 61,725
Int. Cl. F16h *27/02*
U.S. Cl. 74—25 **14 Claims**



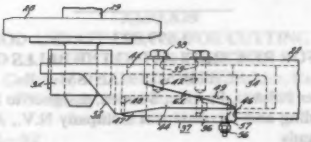
A roller-band device including an idler roller, drive roller and band, is mounted on a carriage movable linearly relative to the band so that the angle of rotation of the drive roller is related to the distance traveled by the carriage. The drive roller can be driven to convert rotary motion to linear motion or the carriage can be driven to convert linear motion to rotary motion. Means including a pulse generator coupled to the drive roller produces a very accurate readout of the position of the carriage.

3,699,820

CHAIN ADJUSTER FOR ELEVATING SCRAPER

James W. Voth, Springfield, Ill., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed March 19, 1970, Ser. No. 126,012
Int. Cl. F16h *7/10*
U.S. Cl. 74—242.14 R **9 Claims**



An adjuster for an endless chain or belt mechanism includes a removable ram interposed between frame and tensioning members. Releasable fastening means not only adjustably secure the tensioning member relative to the support member but also releasably fasten the cylinder element of the ram to one of the members. Upon loosening of the fastening means,

the ram can be expanded by introduction of pressure fluid to selectively adjust the position of the tension member relative to the support member.

3,699,821

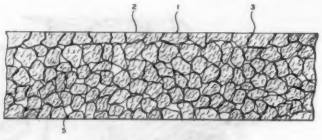
DETERMINATION OF VOIDS TO SOLIDS RATIO IN POROUS MATERIALS

William C. Hahn, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Jan. 4, 1971, Ser. No. 103,378

Int. Cl. G01n *15/08*

U.S. Cl. 73—432 R **8 Claims**



An etchable surface on which a pattern representing solids and voids is etched to remove a portion of the surface which, in respect to the weight of the total etchable surface, represents the percentage of the area occupied by the voids.

3,699,822

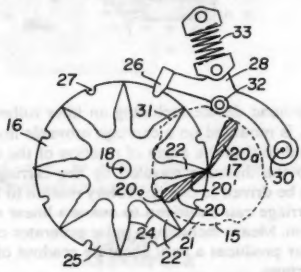
INDEXING DRIVE

Ernest Wildhaber, 124 Summit Drive, Brighton, N.Y.

Filed June 17, 1971, Ser. No. 154,126

Int. Cl. F16h *55/04*; B23q *17/02*

U.S. Cl. 74—437 **13 Claims**



A continuously rotating driver and an element to be intermittently indexed are mounted on parallel axes. The driver has an oblong actuating portion that engages generally radial projections of said element. Adjacent projections are separated by spaces whose opposite sides converge towards the axis of said element. The contour of the actuating portion is free of concave curvature while said projections have sides with convex and concave curvature. Preferably the oblong actuating portion is shaped to hold said element in both rotational directions during indexing.

3,699,823

DEVICE FOR RE-CIRCULATING THE BALLS OF A BALL SCREW MECHANISM

Sven Walter Nilsson, Partille, Sweden, assignor to SKF Industrial Rading and Development Company N.V., Amsterdam, Netherlands

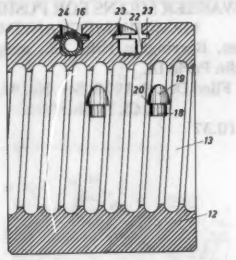
Filed Jan. 19, 1971, Ser. No. 107,655

Claims priority, application Sweden, Jan. 20, 1970, 620170/1970

Int. Cl. F16h *55/04*

U.S. Cl. 74—459 **3 Claims**

In a ball nut mechanism the ball return means for recirculating the balls from one end of the mechanism to the other is designed as a tube which is substantially U-shaped, the end portions of the tube being fitted in bores in the nut body of the mechanism. The tube furthermore is countersunk in a channel running transversally over the nut body between said bores. On a level above the tube resting in the channel, this is provided with a longitudinal groove in each of its side walls, in which grooves a locking member is insertable. Said locking member, being of a deformable material, is so much longer than the channel that it extends out over enlarged portions of the bores, where it is bent down over the tube, thereby being secured against longitudinal displacement.



3,699,824

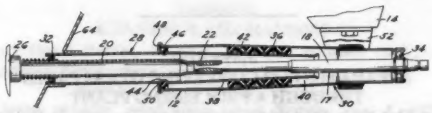
ENERGY ABSORBING STEERING COLUMN FOR A MOTOR VEHICLE

Karl Staudenmayer, Cologne-Weidenpesch, Germany, assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 850,360, Aug. 15, 1969, abandoned. This application April 5, 1971, Ser. No. 131,441

Int. Cl. B62d *1/18*

U.S. Cl. 74—492 **8 Claims**



An energy absorbing steering column for a motor vehicle having a pair of telescopic steering shaft sections and a pair of telescopic tubular sections that form an outer housing. The tubular sections are separated by a plurality of prestressed elastomeric members that are compressed when the column is collapsed whereby energy is absorbed.

3,699,825

INTEGRATED AND FUNCTIONALLY IMPROVED ELECTRIC ERASING MACHINE AND ACCESSORY TOOL

Louis J. Misuraca, 1359 Romulus Drive, Glendale, Calif.

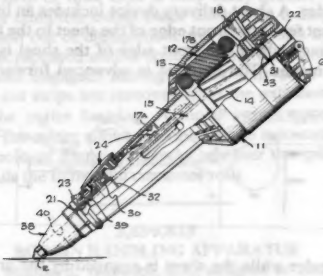
Filed Sept. 9, 1970, Ser. No. 70,710

Int. Cl. G05g *5/06*

U.S. Cl. 74—527 **11 Claims**

The application discloses a hand-held and directed tool, typified herein as an electric erasing machine, embodying an electric motor equipped with a tubular shaft supported in a housing which provides resiliently mounted, preloaded ball bearings therefor, the shaft having precisely concentric, self-holding, tapered end portions forming external, frusto-conical seats upon which to rapidly mount chucks or other tools, either singly or plurally, and having slotted ends or other suitable means engageable by concommitant, restrictive means integral with the housing for holding, or locking the shaft against rotation whenever necessitated for the manual application or

removal of tools or accessory devices. The shaft is especially processed to provide precisely concentric (rotational) mounting and operation of any compatible tool or accessory applied thereon; said application (or removal) being accomplished instantly.



3,699,826

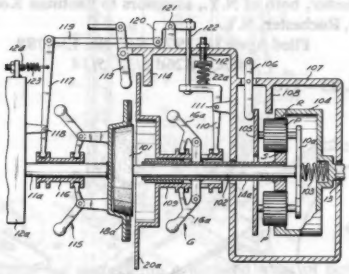
VARIABLE RATIO TRANSMISSION

Edwin T. Lumb, 530 N. W. 144th Street, Miami, Fla.

Filed Feb. 25, 1971, Ser. No. 118,701

Int. Cl. F16h *5/46, 57/10*

U.S. Cl. 74—752 E **10 Claims**



Variable ratio, planetary gear-type transmission having the input drive coupled to a rotatable carrier for the planet gears, the output driven by the ring gear, and a governor for regulating the speed of the sun gear. A torque coupling which accommodates slippage acts between the sun gear and the input drive, under the control of the governor, to control the gear ratio.

3,699,827

AXIAL ACTUATOR AND FORCE CONTROL FOR ROTARY MEMBERS, ESPECIALLY VARIABLE SPEED DRIVES

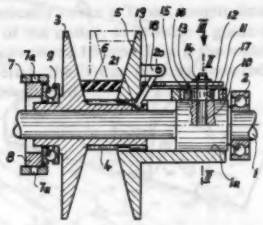
Hilmar Vogel, Gartenstrasse 1E, 8033 Krailling b. Munich, Germany

Filed July 9, 1971, Ser. No. 161,072

Int. Cl. F16h *9/00*

U.S. Cl. 74—230.17 C **11 Claims**

An axial actuator or torque-responsive contact-pressure control, especially for variable-speed drives having a sheave with at least one axially movable disk for varying the pitch diameter of a transmission system having a flexible member interconnecting the adjustable sheave with a further sheave, e.g., a belt or chain transmission. The actuator or torque-responsive control, which has a relatively small mass and substantially no play, comprises a radial pressure pin shiftable along the axis of the adjustable sheave and/or angularly displaceable relative thereto and within a body defining a surface of revolution with an axis lying along a radius. A pair of pressure shoes have surfaces of a radius of curvature corresponding to that of the surface of revolution and planar flanks tangential to the pressure pin, while being received between the latter and the soffit of the surface of revolution so that the angle of attack of the pressure pin on the pressure shoes is varied in accordance with the position of the movable sheave disk. A force-transmitting system between the latter disk and the pressure shoes defines the ratio of pressure-pin movement to disk movement.



3,699,828

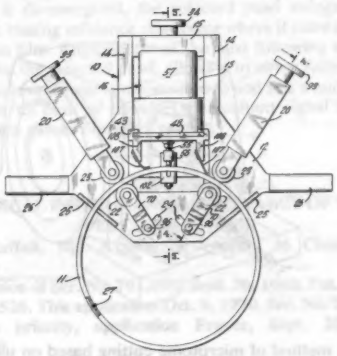
PIPE GROOVER

Edward Walter Platek, Linden, and William A. Horr, Hamburg, both of N.J., assignors to Victaulic Company of America, South Plainfield, N.J.

Filed Dec. 2, 1970, Ser. No. 94,294

Int. Cl. B23b *5/16*

U.S. Cl. 82—4 C **12 Claims**



A portable tool for machining pipe, particularly suited for forming an external circumferential groove adjacent the end of a plastic pipe section. A motor driven cutter is held pointed toward the axis of the pipe by guide and support rollers which are mounted on adjustable arms adapted to engage pipes of different diameters. One rotation of 360° suffices to produce a completed groove.

3,699,829

METHOD AND APPARATUS FOR CUTTING GLASS BOTTLES AND THE LIKE

Ephrem J. Gelfman, 855 Orman Drive, Boulder, Colo.

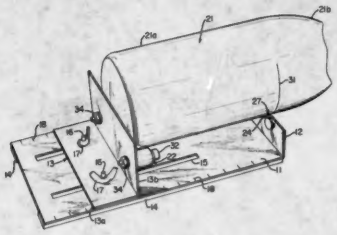
Filed July 10, 1970, Ser. No. 53,741

Int. Cl. B23b *3/04, 5/14*

U.S. Cl. 82—92 **13 Claims**

A method and apparatus for cutting hollow cylindrical members such as glass bottles includes rotary support structure on which a hollow cylindrical member may be rotated about its axis. The rotary support structure includes axially and laterally spaced support rollers with a pair of the laterally spaced rollers adjustable toward and away from the other laterally spaced rollers to make a cut of a selected length. One

support roller has a cutting edge engageable with the periphery of the supported member during rotation for forming a circular score line with a full revolution thereof. Heat is applied to the member along the score line such as by a flame,



and the member is then rapidly cooled such as by quenching with ice to effect a break along the score line. The edges at the break are smoothed by sanding with an abrasive material or the like.

3,699,830

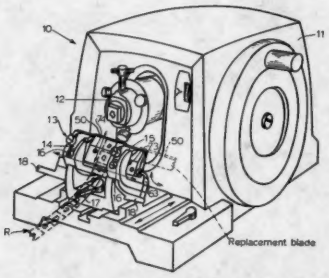
METHOD UTILIZING A DISPOSABLE BLADE IN MICROTOME CUTTING

John E. P. Pickett, 3323 Pinafore Drive, Durham, N.C.

Continuation-in-part of Ser. No. 885,143, Dec. 15, 1969, Pat. No. 3,599,523. This application March 22, 1971, Ser. No. 126,674

Int. Cl. B26d *3/00*

U.S. Cl. 83—13 **9 Claims**



The method of microtome cutting based on using the conventional, non-disposable, thick, inflexible microtome knife that requires resharpening after each period of wear and substantial blade holder adjustments to obtain and maintain the proper cutting angle is replaced by a method based on using a thin, flexible and disposable blade having a microtome quality cutting edge and which method allows the technician to install and replace blades without disturbing or repositioning the holder.

3,699,831

CUTTER AND CREASER

Harry E. Mowry, Sewickley Heights, Pa., assignor to Miller Printing Machinery Co., Pittsburgh, Pa.

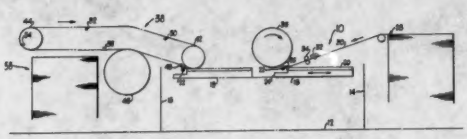
Filed May 3, 1971, Ser. No. 139,593

Claims priority, application Germany, May 8, 1970, P 20 22 508.5

Int. Cl. B65h *5/10, 5/12, 29/04*

U.S. Cl. 83—94 **5 Claims**

A cutter and creaser is fabricated from the components of a flat bed letter press. A carriage is mounted on the press frame member for horizontal longitudinal reciprocal movement between the feed end of the press and the delivery end of the press. A die plate suitable for cutting or creasing paperboard or the like is positioned on the upper surface of the carriage, or in some cases, wrapped around the cylinder. A cylinder is positioned above the carriage and is arranged to press a sheet into the die plate as the carriage moves reciprocally thereunder. A sheet delivery device includes an inclined feedboard that feeds the front edge of the sheet to the front edge of the carriage where the front edge of the sheet is engaged by gripper means. The carriage is advanced forwardly beneath



the cylinder while the sheet is engaged by the gripper device on the carriage to press the sheet against the die plate. A sheet delivery device includes gripper means to engage the front edge of the sheet on the carriage and transfer the sheet from the carriage to a stacking device. Another embodiment includes gripper means on the cylinder to engage the front edge of the sheet and transfer the sheet to the gripper device on the front of the carriage.

3,699,832

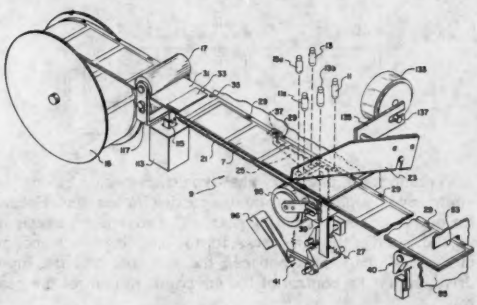
CONTROL CIRCUIT FOR AUTOMATING THE OPERATION OF A FILM CUTTER OR LIKE APPARATUS

Gerald C. Smith, Honeoye, and Raymond J. Williams, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed April 16, 1971, Ser. No. 134,789

Int. Cl. B26d *5/32, 5/34*

U.S. Cl. 83—210 **18 Claims**



A control circuit for automating the operation of a film cutter of the type suitable for cutting large, continuous rolls of film having regularly spaced edge perforations fixedly oriented with respect to the exposed frames thereof which continuous rolls are made up of spliced, intermingled customer rolls of 12 or 20 frames each. Cutting of the film into strips of four exposure frames each, plus a strip of four exposure frames and the splice frame, is controlled by the response of photosensitive detectors which monitor passage of the film perforations and the splice frame. The photosensitive detectors are connected to a counting circuit which generates, in its first frame first mode of operation, an output signal for each four film perforations counted. In its Last Frame First mode of operation, the counting circuit is logically controlled so that it counts five perforations prior to the first cut in the customer roll and four perforations thereafter. In response the output signal of the counting circuit, a pivotally mounted pawl located in the cutter is caused to swing upwards to engage the next following film perforation. Engagement of the pawl, in turn, causes the film drive to stop. The cutter blade is actuated in response to engagement of the pawl with the film perforation, thereby severing an initial strip of film containing four

images in the First Frame First mode or an initial strip of film containing five images in the Last Frame First mode. The same signal which caused the film drive to stop and the cutter to sever a strip of film, after a time delay greater than that required for complete cutter blade movement is employed to drop the pawl out of engagement and restart film drive. This operation is repeated until a splice is sensed, whereupon the pawl remains engaged, halting further film drive until the previously cut strips are removed from the exit therefor provided in the cutter housing. A mode switch appropriately located on the cutter allows the operator to automatically cut the larger rolls of film regardless of whether the splice frame leads or trails the individual customer rolls.

3,699,833

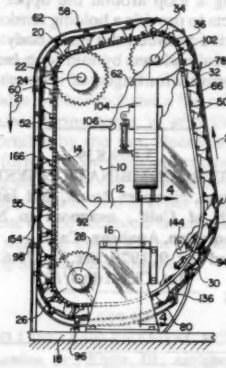
BOBBIN HANDLING APPARATUS

William E. Stoppard, Warwick, R.I., assignor to Lessona Corporation, Warwick, R.I.

Division of Ser. No. 847,240, Aug. 14, 1969, Pat. No. 3,613,862. This application April 29, 1971, Ser. No. 138,559

Int. Cl. B26d 7/06

U.S. Cl. 83—410 **10 Claims**



Apparatus for segregating a jumbled mass of bobbins and delivery of the bobbins one at a time in axial orientation. A chain conveyor includes a plurality of buckets for receiving bobbins. These buckets open inwardly and together form the bottom of a hopper which receives the jumbled bobbins. As the conveyor is driven each bucket is adapted to receive a bobbin from the hopper and carry the bobbin upwardly along a substantially straight path to a discharge chute at an upper portion of the apparatus. Concurrently with such movement of each bucket and its bobbin a finger is moved across the inclined edge of the bucket to transfer any strands of yarn extending from the bobbin across the edge and into a cutter. Alternatively, each bucket may be provided with a cutter which is moved across the inclined edge to sever the loose strands.

3,699,834

BIMODAL FILM CUTTER ADAPTED TO HANDLE DIFFERENT FILM WIDTHS

Thomas W. Bracken, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

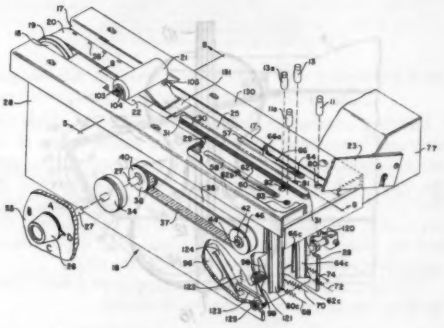
Filed April 16, 1971, Ser. No. 134,788

Int. Cl. B65h 9/20

U.S. Cl. 83—446 **9 Claims**

A film cutter adapted to sever individual customer orders of 110 or 126 type film into a number of segments. The individual customer orders are spliced together to form a large, continuous roll which is placed in the film cutter. If the splice frame leads the individual customer orders, the film cutter is operated in a First Frame First mode. If the splice frame trails the individual customer orders, the film cutter is operated in a First Frame First mode.

Rotation of a selection knob conditions the film cutter for handling either width of film in either mode of operation. Such conditioning automatically causes selection of one of four pivotally mounted pawls, the selected pawl being properly located for the type of film to be cut and the mode of operation to be used. At the same time, rotation of the selection knob automatically raises a T-bar, longitudinally disposed in the film bed of the cutter, to provide a guide surface for one edge of the narrower 110 type film. If the wider 126 type film is to be severed, the T-bar remains lowered and only the proper pawl is selected.



When a pawl solenoid, which controls movement of the selected pawl, is energized, the selected pawl is forced downward out of engagement with a film edge perforation. This action permits film drive to commence. When the pawl solenoid is de-energized, the selected pawl swings upward under the biasing influence of a spring where it rides under the still driven film. Engagement of the next following edge perforation by the selected pawl, allows it to swing fully upward, which final movement is transmitted to and sets a microswitch located in its path of travel. The resultant signal from the microswitch causes film drive to stop.

3,699,835

MUSICAL INSTRUMENTS, ESPECIALLY OF THE PERCUSSION TYPE

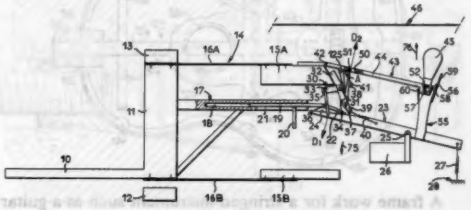
Andre Raffali, 188, Avenue de Verdun, 36 Chateauroux, France

Division of Ser. No. 761,099, Sept. 20, 1968, Pat. No. 3,559,526. This application Oct. 9, 1970, Ser. No. 79,499

Claims priority, application France, Sept. 25, 1967, 67122069

Int. Cl. G10c 3/18

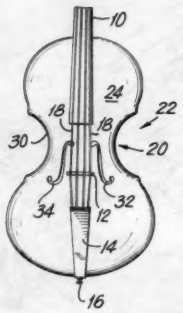
U.S. Cl. 84—236 **10 Claims**



In application of the invention to a keyboard musical instrument such as a piano, the key is guided by a deformable parallelogram linkage, so that during its actuated displacement, the key remains parallel to its original orientation; between each key and the associated hammer is interposed a transmission which, when the key is depressed, gives the hammer an accelerated movement with respect to the movement of depression of the said key; the release of the transmission for the free return of the hammer after striking is effected after the full

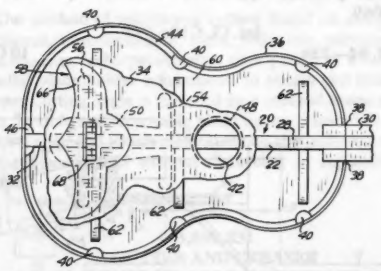
depression of the key during the sole inertia movement of the hammer towards the wire; the effect of the soft pedal is obtained by continuous modification of the active length of an intermediate lever of the transmission.

3,699,836
STRINGED MUSICAL INSTRUMENT
Leon Glasser, 390 Bedford Park Blvd., Bronx, N.Y.
Filed Sept. 9, 1970, Ser. No. 70,237
Int. Cl. G10d *3/00*
U.S. Cl. 84—291 **14 Claims**



A stringed musical instrument such as a violin resembling a more expensive one in appearance and sound. The sound box portion of the violin includes top, bottom, and side walls which are formed by a plurality of woven, resin impregnated fiberglass sheets being in number between five and nine and in thickness between 0.006 to 0.009 inches. An outer layer of impregnated wood grained paper is heat-sealed to the fiberglass plies, forming the outer surface of the sound box. This outer surface takes on the appearance of a grainy wood finish, thereby resembling natural wood violins.

3,699,837
FRAME FOR A MUSICAL INSTRUMENT AND METHOD OF MAKING SAME
Domenico M. Annessa, 3536 Burns Avenue, Detroit, Mich.
Filed Dec. 27, 1971, Ser. No. 212,239
Int. Cl. G10d *3/00*
U.S. Cl. 84—291 **5 Claims**

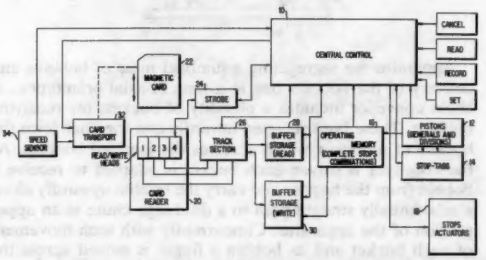


A frame work for a stringed instrument such as a guitar or violin is comprised of a hard wood single stabilizing central one piece dorsal spine which includes a lower hook portion for support of the back and a portion of the top of the instrument and an offset longitudinally extending upper hooked portion forming a support for another portion of the top. A plurality of cross struts are attached to the dorsal spine to support the back. Upright side blocks are supportably interposed between the top and back and are secured to the sides along interior portions thereof respectively spaced outwardly of the ends of said cross struts. Additional blocks are secured on opposite sides of end portion of the dorsal spine extending between and engaging the top and back.

3,699,838
GUITAR PICK
Edgar L. Montgomery, 729 N. Cole Avenue, Hollywood, Calif.
Filed July 2, 1971, Ser. No. 159,357
Int. Cl. G10d *3/16*
U.S. Cl. 84—322 **3 Claims**

A guitar pick comprising as an integral part of its construction a band extending outward from each side of the main body and forming a loop around the upper portion of said pick. Said loop acts to provide a holding tension when a thumb or finger is inserted between the main body of the pick and said loop. The area enclosed by said loop being of such size and shape as to provide for fingers of various sizes and various gripping postures.

3,699,839
CAPTURE COMBINATION SYSTEM
Thomas R. Denigan, Newport Beach, and James L. Thomas, Placentia, both of Calif., assignors to North American Rockwell Corporation, Anaheim, Calif.
Filed Oct. 9, 1970, Ser. No. 79,611
Int. Cl. G10b *3/10*
U.S. Cl. 84—345 **15 Claims**



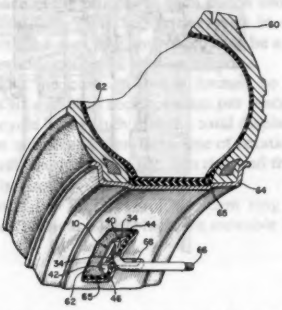
A capture combination system for use in an electronic organ provides rapid reprogramming of the entire combination memory while permitting manual selection of desired stop combinations at any time. Desired stop combinations are selected for each piston and set into the working memory of the system. These combinations, upon command, are transferred from the working memory to a storage or external memory. A full combination of stop settings may be stored on the external memory by transfer from the internal memory, and a number of such external memories corresponding to a number of different full combinations of stop settings thus may be prepared and, subsequently, selectively presented to the system as desired. The combination settings from the external memory are transferred upon command into the internal working memory for establishing the desired combination of stop settings therein. Transfer into or out of the external memory requires but a few seconds. Whenever desired, the working memory may be altered to modify one or more stop combinations, whether set manually, or entered therein from the external memory and, in the latter case, while retaining the combinations recorded in the external memory.

3,699,840

PUSH-ON BRIDGE WASHER FOR PNEUMATIC TIRE TUBES

Michael W. Cook, Mogadore, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 17, 1971, Ser. No. 144,136
Int. Cl. F16b *17/00, 43/00;* B60c *23/10*
U.S. Cl. 85—36 6 Claims



A lightweight one-piece bridge washer for use in conjunction with a pneumatic tire tube and wheel rim to grip the valve stem and hold the tube away from the valve stem opening in the rim. The bridge washer includes a flat rectangular base for engaging the tube, spring tongs to grip the valve, and end members supportable by the rim. Necessary strength is provided by ridges formed in the base and end members.

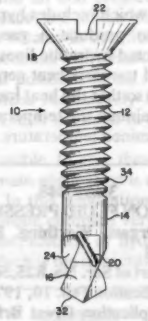
The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawing and the following detailed description.

3,699,841

DRILLING AND REAMING SCREW

James Curtis Lanius, Jr., Elgin, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed March 31, 1971, Ser. No. 129,829
Int. Cl. F16b *25/00*
U.S. Cl. 85—41 1 Claim



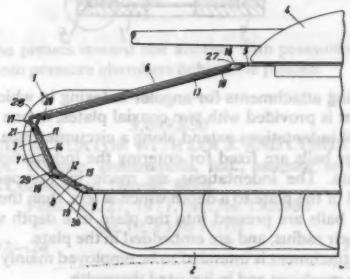
A self drilling screw for drilling and fastening a first work member to a relatively harder second work member. A drill tip having material removing members formed thereon and situated between drilling flutes on the tip. The material removing members becoming inoperative as a result of breaking on contact with the second relatively hard work member so as to permit threads to be formed in the second work member.

3,699,842

PROFILE ELEMENTS FOR JOINING ARMOR PLATES

Klaus Marbach Grewing, and Fritz Hacker, both of Ludwigsburg-Ossweil, Germany, assignors to Firma Dr.-Ing. h.c.F. Porsche K.G., Stuttgart-Zuffenhausen, Germany

Filed Dec. 16, 1969, Ser. No. 885,410
Claims priority, application Germany, Jan. 14, 1969, P 19 01 502.2
Int. Cl. F41h *7/04*
U.S. Cl. 89—36 H 7 Claims



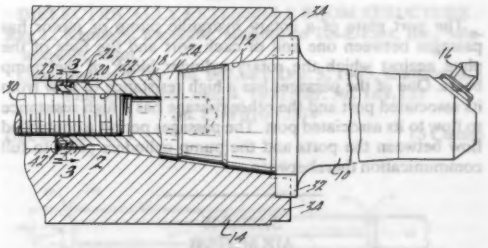
A connection for the shell of armored vehicles, wherein the plates of the shell are disposed in an angular, planar or stepwise relationship, thereby forming a hollow space. The plates are connected at the junction points by means of separate profile bars formed as hollow or solid components. The profile bars have shoulders constructed as mounting sections for the plate edges. For multiple wall shells, the profile bars can be provided with shoulders arranged in a stepwise manner.

3,699,843

TOOL HAVING RESILIENT BUMPER

Allen N. Sweeny, Grosse Pointe Farms, Mich., assignor to Devlieg Machine Company, Royal Oak, Mich.

Filed Jan. 20, 1971, Ser. No. 108,063
Int. Cl. B23b *27/00*
U.S. Cl. 90—11 A 5 Claims

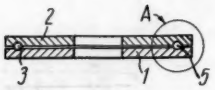


A tool or tool holder having a shank which is received in the socket of a machine tool spindle or other tool carrier. A resilient bumper ring is fitted on the rear end of the shank to protect both the shank and the socket from damage. In one embodiment of the invention the bumper also serves as a wiper to clean the socket.

3,699,844
DIVIDING ATTACHMENT

Evgeny Mikhailovich Perminov, Minsk, U.S.S.R., assignor to Minsky opytny zavod Spetsialnogo Konstruktoskogo Bjuro No. 3, Minsk, U.S.S.R.

Filed Aug. 14, 1970, Ser. No. 63,783
Claims priority, application U.S.S.R., Aug. 14, 1969, 1361761; Aug. 14, 1969, 1361763; Aug. 14, 1969, 1361764
Int. Cl. B23q *17/04*
U.S. Cl. 90—57 **2 Claims**



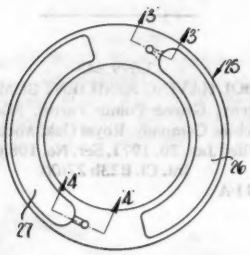
Dividing attachments for angular indexing in which the attachment is provided with two coaxial plates, in one of which spherical indentations extend along a circumference, while in the other balls are fixed for entering the indentations of the first plate. The indentations are made by compacting the material of the plate to a depth which is less, than their radius, and the balls are pressed into the plate to a depth which exceeds their radius, and are embedded in the plate.

The attachment is intended to be employed mainly in metal-working machines and in jigs used therewith.

3,699,845
ROTARY HYDRAULIC PUMPS AND MOTORS

Richard Joseph Ifield, Beecroft, New South Wales, Australia, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 24, 1970, Ser. No. 58,059
Int. Cl. F01b *13/04*
U.S. Cl. 91—6.5 **11 Claims**



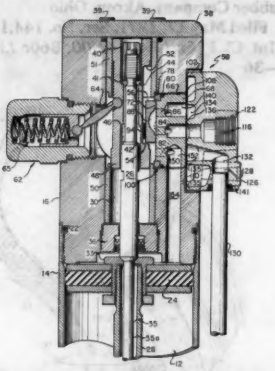
The port plate of a rotary hydraulic pump or motor has passages between one end of each port and the face of the plate against which the rotary cylinder block of the pump bears. One of the passages has a high resistance to flow from its associated port and the other passage has a high resistance to flow to its associated port. The passages permit a controlled flow between the ports and the pump cylinders prior to full communication therebetween.

3,699,846
AIR MOTOR

Joseph M. Stomper, Norridge, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Dec. 30, 1970, Ser. No. 102,720
Int. Cl. F01l *31/02*; F15b *13/04*
U.S. Cl. 91—346 **1 Claim**

The following specification describes an air motor formed of three coaxial cylinders or housings assembled by a simple threading operation with one end housing having a spring biased valve assembly detachably inserted therein for directing air to opposite piston sides. A shuttle in one housing controlling the valve assembly is guided by a sleeve bearing to

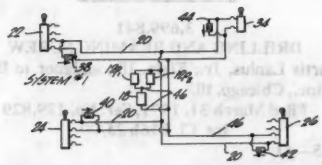


minimize wear, and a conduit transmitting air from the valve assembly to the opposite end housing is simply connected by a single pair of fittings.

3,699,847
COOLED HYDRAULIC SYSTEM

Jane Little, Long Beach, Calif., assignor to McDonnell Douglas Corporation

Filed Feb. 4, 1971, Ser. No. 112,712
Int. Cl. F15b *11/16*
U.S. Cl. 91—411 R **13 Claims**



A hydraulic system which includes bypass restrictors at the extremities thereof to produce a predetermined flow of hydraulic fluid in selected hydraulic lines. The predetermined flow of hydraulic fluid transfers heat generated in the system throughout the system so that the heat loss along the hydraulic lines is sufficient to maintain the temperature of the hydraulic fluid below a predetermined temperature.

3,699,848
RADIAL PISTON FLUID PRESSURE MOTOR

Charles Scott Prendergast, Worthing, England, assignor to Cam Rotors Limited

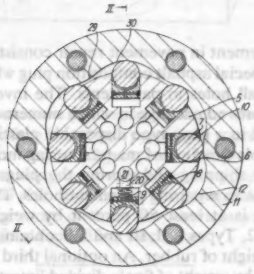
Continuation-in-part of Ser. No. 825,507, May 19, 1969, abandoned. This application Feb. 10, 1971, Ser. No. 114,144
Claims priority, application Great Britain, May 23, 1968, 24,727/68
Int. Cl. F01b *13/06*
U.S. Cl. 91—487 **7 Claims**

A hydraulic pump or motor has a central cylinder block formed with eight cylinders of rectangular cross-section. Each containing a piston which projects radially outwards from the cylinder block, and maintains contact with a cam surface formed on the inner surface of a surrounding cam ring. Each piston comprises a rectangular shoe which is a sliding fit in its cylinder and which carries a roller on a partly circular seating

which extends over the axial length of the shoe, the roller following the cam surface. The seating is relieved to provide a space in which oil pressure can develop and substantially balance the reactive force between the roller and the cam. As the cylinder block rotates the pistons reciprocate within their cylinders as the rollers follow the cam surface. Hydraulic pressure at the bottom of a shoe is normally used to maintain contact between a piston and the cam ring, but springs may also be used. The space at the bottom of each piston shoe communicates alternately with inlet and outlet ports in a member which is rigid with the cam ring and which may be a plate with face ports or a cylindrical pintle with radial ports.

In one example the cam surface is formed so that each piston performs six cycles of reciprocation per revolution, the nature of each cycle being such that the total displacement of the unit remains uniform at a uniform rate of rotation and the radial pressure reaction between the cam ring and the cylinder block is always balanced.

In another example the form of the cam ring is in two generally semi-cylindrical parts which are movable and which



can be jointly adjusted radially in relation to the central axis to vary the length of stroke of the pistons.

One kind of fluid pressure unit has a rotor and a coaxial stator one of which surrounds the other and is formed with an internal cam surface while the inner member is formed with two or more cylinders arranged substantially radially each containing a piston which has an end projecting from the cylinder against the cam surface and which slides to and fro in the cylinder as the rotor rotates in use. Such units have external outlet and inlet connections with which each cylinder communicates in the angular positions of the rotor in which the corresponding piston slides respectively inwards and outwards within that cylinder. Either the inner or the outer member may be the rotor.

Although it is possible to use these units as motors or pumps, one of their main application is as relatively low speed, high torque motors. In this application their weight and size for a given output torque compare very favorably with those of a high-speed motor, electric or hydraulic, combined with reduction gearing, which is the conventional alternative.

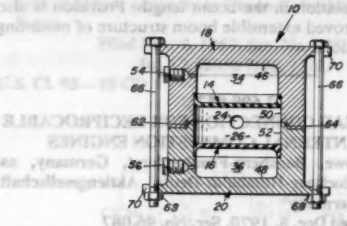
3,699,849

HYDRAULIC CELL FOR CALIBRATING A PRESSURE TRANSDUCER

Raymond J. Zawadski, Spokane, Wash., assignor to The United States of America as represented by the Secretary of the Interior

Filed Nov. 12, 1970, Ser. No. 88,958
Int. Cl. F01b *1/02*
U.S. Cl. 92—61 **2 Claims**

A hydraulic cell is used for calibrating an electro-mechanical pressure transducer. The transducer is positioned in the cell between an opposed pair of free-floating pistons. Calibration pressures are uniformly exerted upon the transducer by



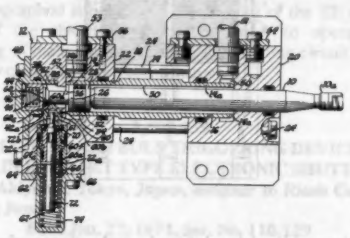
forcing the pistons toward one another with pressurized fluid injected into pressure chambers behind the pistons.

3,699,850

FLUID ACTUATOR WITH LOCK AND CUSHION

Douglas A. Wagner, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1971, Ser. No. 193,055
Int. Cl. F15b *15/26*
U.S. Cl. 92—24 **7 Claims**



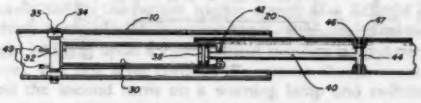
A fluid actuator in the form of a differential fluid pressure operated piston rod in a cylinder has the piston rod retained in a retracted position by a spring biased pin and lock arrangement which in its normal biased position has the lock in locking engagement with the piston rod, the lock and pin being acted upon by the fluid pressure to effect its unlocking from the piston rod, a cushion cup being positioned behind the enclosed end of the piston rod to move axially upon movement of the piston rod into position to restrict movement of the lock into its normal locking position.

3,699,851

DIELECTRICALLY EXTENSIBLE BOOM STRUCTURE

Ray L. Kennedy, Excelsior, assignor to Tel-E-Lect, Inc., Minneapolis, Minn.

Continuation of Ser. No. 882,661, Dec. 5, 1969, abandoned.
This application Aug. 4, 1971, Ser. No. 169,137
Int. Cl. F01b *15/04*
U.S. Cl. 92—119 **13 Claims**



An extensible boom structure of a dielectric type in which a plurality of telescopic members some of which are made of a dielectric material are slidably mounted together to provide a telescopic boom structure with motive means for extending and retracting sections of the same being mounted internal of

the boom structure and made in part of a metal and part of a dielectric material. The parts are connected respectively to portions of the boom structure of the same material to maintain dielectric isolation in the boom length. Provision is also made in the improved extensible boom structure of mounting additional extensions.

3,699,852

CYLINDER HEAD CONNECTION FOR RECIPROCABLE PISTON INTERNAL COMBUSTION ENGINES

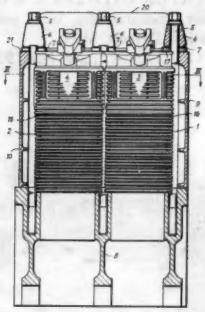
Hans-Ulrich Howe, Bensberg-Frankenforst, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Koln-Deutz, Germany

Filed Dec. 8, 1970, Ser. No. 96,087

Claims priority, application Germany, Dec. 10, 1969, P 19 61 804.3

Int. Cl. F16j *13/02*

U.S. Cl. 92—169 **9 Claims**



A reciprocable piston internal combustion engine having one or more rows of cylinders with individual cylinder heads, in which two adjacent cylinder heads are by expandable screw bolts clamped to the pertaining cylinders and the crank case so that one or more expandable screw bolts common to two adjacent cylinder heads connects or connect two adjacent cylinder heads through a bridge with the crank case.

3,699,853

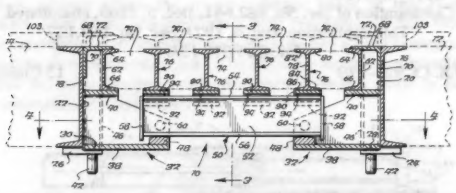
COMPOSITE EXPANSION JOINT

Harry O. Wicks, III, Hamburg, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.

Filed Feb. 16, 1971, Ser. No. 115,519

Int. Cl. E01c *11/10*

U.S. Cl. 94—18 **12 Claims**



A composite expansion joint assembly of alternating elastic sealing elements and rigid structural members slidably mounted on transversely extending support beams by tie-down brackets which limit vertical displacement of the structural members. The assembly is prefabricated as a unit and can be readily inserted into and removed from an expansion groove without the customary blocking out.

3,699,854

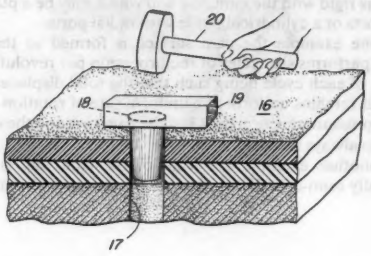
PAVEMENT REPAIR

Walter G. Doherty, Carmel, N.Y.

Continuation-in-part of Ser. No. 804,802, March 6, 1969, abandoned. This application March 3, 1971, Ser. No. 120,675

Int. Cl. E01c *21/00*

U.S. Cl. 94—22 **5 Claims**



An improvement in pavement repair consists of a ready-to-use molded special asphalt composition plug which is intended for filling small holes in pavements. The invention also embraces an improved package in which numerous asphalt plugs are contained in a gang type disposable plastic matrix which serves the triple function of manufacturing mold and multiple container for shipping and storing the plugs until they are desired for use in repairing pavement holes. The special composition plug is at least 50 percent by weight of A.S.T.M. asphalt D–312, Types I, II, III and IV containing about 2 to 4 percent by weight of rubber. An optional third ingredient is up to 30 percent by weight of finely divided limestone or portland cement.

3,699,855

ROAD SURFACING MACHINES

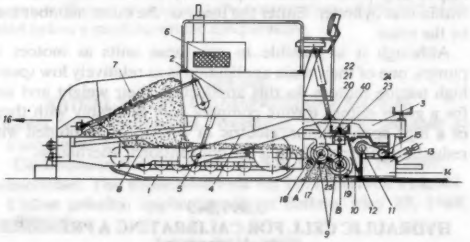
Gerhard Leister, Birkenfeld, Germany, assignor to ABG-Werke G.m.b.H., Weser, Germany

Filed Dec. 21, 1970, Ser. No. 99,834

Claims priority, application Germany, Dec. 27, 1969, P 19 65 141.3

Int. Cl. E01c *19/48*

U.S. Cl. 94—46 **6 Claims**

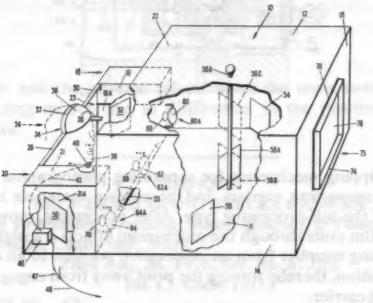


A road surfacing machine having two parallel material distributing screws provided one behind the other driven from their ends with the trailing screw coupled to the forwardly disposed screw and the two screws consisting of a single work unit for distributing material in the same direction. One of the two screws is vertically displaceable relative to the other.

3,699,856
MOVEMENT MONITORING APPARATUS

Ronald W. Chabot, Wilmington; George S. Leonard, Billerica, and David Sheena, Cambridge, all of Mass., assignors to Whittaker Corporation

Filed April 1, 1970, Ser. No. 24,537
Int. Cl. G01d 9/42
U.S. Cl. 95—1.1 8 Claims

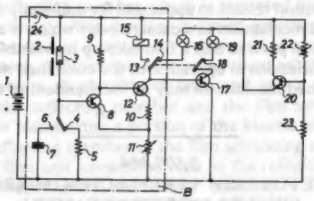


Human jaw motion is photographed from the front as well as the side of the face by using a point light source attached to the subject's chin. As the subject moves his jaw a photograph of the light spot tracing is superimposed on a previously taken still picture of the chin. By the use of appropriate mirrors and lenses any one or more of three jaw views may be recorded, namely front, right side, and left side views.

3,699,857
COMBINED BATTERY TEST AND LIGHT METER FOR A PHOTOGRAPHIC CAMERA

Karl Wagner, Ottobrunn, and Bernhard von Fischern, Munich, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 8, 1970, Ser. No. 53,249
Claims priority, application Germany, July 12, 1969, P 19 35 466.6
Int. Cl. G03b 7/08
U.S. Cl. 95—10 CE 17 Claims

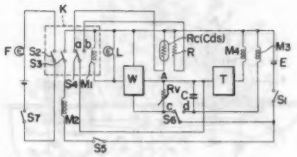


Indicator lamps for indicating sufficient and insufficient light for exposure are used for battery testing by connecting them in the emitter circuit of a switching transistor whose base voltage is controlled by a voltage divider in parallel with the battery. The voltage divider is adjusted to allow the lamp to light if the battery voltage exceeds the proper operating voltage or if the battery voltage is between a minimum acceptable voltage and the operating voltage. Otherwise the indicator lamps do not light regardless of the light available for exposure.

3,699,858
CAMERA EQUIPPED WITH AUTO-FLASH DEVICE

Mitsutoshi Ogiso, Kawasaki-shi, and Shohei Ohtaki, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1969, Ser. No. 873,998
Int. Cl. G03b 7/08, 15/03
U.S. Cl. 95—10 CD 5 Claims

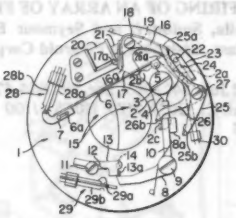


An electronic shutter system for cameras having a shutter speed which is set to a constant value by automatically switching a photoconductor element of the time setting element of the electronic shutter to a predetermined and constant resistor for flash photographing. An electromagnet is provided which is activated when the brightness of a subject to be photographed is below the lowest limit of the EE working range of the electronic shutter in order to operate said switching. A main switch in a flash illuminating circuit is automatically closed by the electromagnet.

3,699,859
AUTOMATIC FLASH BULB TRIGGERING DEVICE FOR USE IN EVER-SET TYPE ELECTRONIC SHUTTER

Hideaki Akiyama, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1971, Ser. No. 110,129
Claims priority, application Japan, Feb. 2, 1970, 45/9077
Int. Cl. G03b 9/70
U.S. Cl. 95—11.5 R 2 Claims



An automatic flash triggering device comprising first and second armature levers that are actuated by an electromagnet connected to the output trigger circuit of a Schmitt circuit which energizes the electromagnet when the brightness of light incident upon a CdS element is below a predetermined level. The first lever controls the camera shutter mechanism and the second turns on a warning lamp and switches the mechanism to a predetermined low shutter speed if a flash bulb is mounted in place. The second lever will not function when the brightness of incident light is higher than a predetermined level while the first lever is actuated. When the brightness is less than a predetermined level, both the first and second levers are actuated the latter operating a suitable mechanism such that the shutter opens at a predetermined slow shutter speed and the flash is fired for proper exposure.

3,699,860

PHOTOGRAPHIC APPARATUS WITH IMPELLER-OPERATED SOURCE OF ARTIFICIAL LIGHT

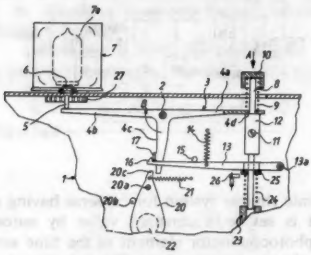
Alfred Winkler, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed May 24, 1971, Ser. No. 146,290

Claims priority, application Germany, May 23, 1970, P 20 25 181.4

Int. Cl. G03b *15/04*

U.S. Cl. 95—11.5 R **12 Claims**



A still camera wherein the release element stresses a spring during a first stage of its movement from the starting position and disengages a blocking lever from a pivotable impeller during the second stage of its movement whereby the spring propels a pin of the impeller against a cartridge which fires a flash lamp or against a piezoelectric block which produces a high-voltage pulse for the firing of an electronic flash unit. At the same time, the impeller opens the shutter so that the subject or scene is illuminated by artificial light while the shutter is open. A second spring urges the release element back to its starting position. During such return movement, the release element returns the blocking lever into engagement with the impeller. The extent to which the release element moves during stressing of the spring which bears against the impeller is adjustable.

3,699,861

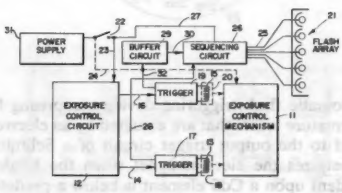
FLASH SYNCHRONIZATION CIRCUIT FOR SEQUENTIAL FIRING OF AN ARRAY OF FLASHBULBS

John P. Burgarella, Sudbury, and Seymour Ellin, Chestnut Hill, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed July 24, 1969, Ser. No. 844,470

Int. Cl. G03b *9/70*; H05b *41/00*

U.S. Cl. 95—11.5 **17 Claims**



In a flash synchronization circuit, an array of flashbulbs are fired sequentially in synchronism with sequential actuations of the shutter mechanism. The shutter mechanism is opened and closed by electromagnets driven by Schmitt triggers. The sequential firing of the flashbulbs is controlled in response to signals derived from the Schmitt triggers and generated by the electromagnets.

3,699,862

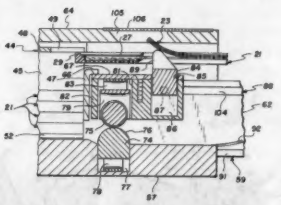
POSITIVELY OPERATED STRIPPING DEVICE FOR CAMERAS

Guilford Edwin Kindig, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 2, 1971, Ser. No. 159,321

Int. Cl. G03b *17/52*

U.S. Cl. 95—13 **16 Claims**



A stripping mechanism for separating photographic prints from transporting carriers and processing materials in film units of the self-processing type. After processing, movement of the film units through the mechanism effects translation of a stripping member from an inoperative position to an operative position, thereby forcing the print away from engagement with the carrier.

3,699,863

COMBINED MECHANISM OF SHUTTER AND FILM IN A CAMERA

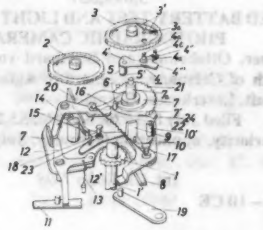
Hideaki Yamamoto, Tokyo, Japan, assignor to Zenza Bronica Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 3, 1970, Ser. No. 43,135

Claims priority, application Japan, June 6, 1969, 44/44057

Int. Cl. G03b *19/04*

U.S. Cl. 95—31 AC **4 Claims**



The invention relates to apparatus for uniformly controlling a combined mechanism in a camera body which is used with a separable film pack so that a film take-up is available independently of variations in operation of the combined mechanism. The combined mechanism may be independent of the shutter release.

3,699,864

DEVICE FOR DRIVING REFLECTING MIRROR OF SINGLE-LENS REFLEX CAMERA

Jun Shimomura, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 25, 1970, Ser. No. 66,688

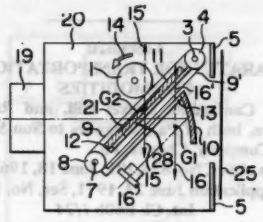
Claims priority, application Japan, Aug. 29, 1969, 44/67945

Int. Cl. G03b *3/00*

U.S. Cl. 95—42 **5 Claims**

A device for driving the reflecting mirror of a single lens reflex type camera having a reflecting mirror system and movable part system with a photometric or a light shielding member. The moments of rotation produced by the unbalanced masses of the reflecting mirror system and the movable part system are arranged in opposing relationship, and

drive means drive both systems simultaneously, so that both moments of rotation nearly cancel each other out, thereby reducing both the shock caused by movement of the reflecting



mirror and the adverse effects upon the movements of the reflecting mirror due to differences in the position of the camera.

3,699,865

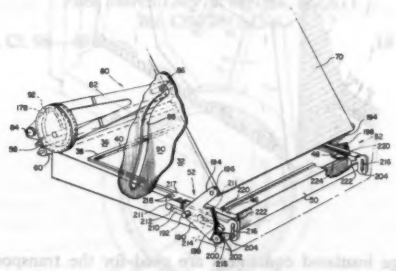
SELF-DEVELOPING REFLEX CAMERA

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 26, 1970, Ser. No. 67,051

Int. Cl. G03b *19/12*

U.S. Cl. 95—42 **11 Claims**



The energy absorbed in decelerating a reflecting member as it reaches the end of its travel is used to perform some useful function associated with the processing of a film unit. The camera includes a support for locating a film unit in position for exposure and film advancing apparatus for engaging and moving a film unit, subsequent to exposure, from its exposure position into the bite of a pair of rolls for subsequent movement to the exterior of the camera. The camera further includes a reflecting member which is mounted for movement between a first position in which it directs an image toward the film unit located in position for exposure and a second position in which it functions as a component of the camera's viewing system. A plurality of links and gear's are coupled between the reflecting member and the film advancing apparatus for transferring a portion of the kinetic energy of the moving reflecting member to the film advancing apparatus to move the film unit toward the rolls as the reflecting member moves between the first and second positions.

3,699,866

CAMERA SHUTTER OPERATING MECHANISM

Kiyoshi Kitai, Tokyo, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Tokyo, Japan

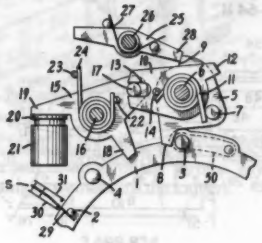
Filed July 23, 1971, Ser. No. 165,085

Claims priority, application Japan, July 23, 1970, 45/63964

Int. Cl. G03b *9/14*

U.S. Cl. 95—63 **3 Claims**

A camera shutter operating mechanism in which a shutter blade-operating ring is rotationally driven in opposite directions for opening and closing the shutter by three coupled driving members in which the direction of rotation of the driving members is such that their rotational forces are all additive in one direction in operating the shutter blade-operating ring in two opposite directions. The first and second driving members are time-delayed coupled to execute rotation in one direction and the third driving member is positively coupled to the second driving member and is held from rotating by an exposure delay or exposure time control circuit controlling the



exposure time of a photographic exposure. Upon release of the third driving members by the exposure time control circuit the rotation of the three driving members is as though they were rotating in a common direction. Division of the driving force between two springs reduces impact forces upon coupling of the driving members. The movement of these driving members in effectively the same direction of rotation likewise reduces impact forces and vibration.

3,699,867

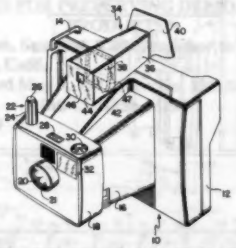
DISTANCE ESTABLISHING ARRANGEMENT FOR PHOTOGRAPHIC CAMERA

John Wolbarst, Boston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 17, 1969, Ser. No. 799,699

Int. Cl. G03b *13/20*

U.S. Cl. 95—44 **9 Claims**



A distance determining device for popularly priced photographic cameras. The device cooperates with a conventional viewfinder to permit the establishing of a predetermined camera-to-subject distance by moving the position of either the photographic subject or the camera. The apparatus provides a transparent member or the like by which a segment of the field of view observed through a viewfinder is visibly differentiated from the remainder of the field. The member is configured such that it encompasses within the field of view, the vertical dimension of a human head when a predetermined camera-to-subject distance has been established. In a preferred embodiment, the segment is visibly contrasted from the remainder of the field of view by a color differential.

3,699,868

COUPLING DEVICE FOR EXPOSURE METER TO APERTURE OF INTERCHANGEABLE LENS IN SINGLE-LENS REFLEX CAMERA

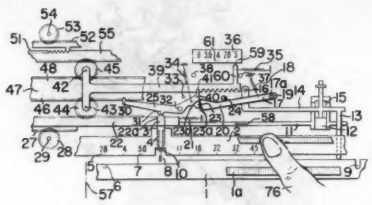
Jun Shimomura, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed April 13, 1970, Ser. No. 27,757

Claims priority, application Japan, April 18, 1969, 44/29640

Int. Cl. G03b 9/02

U.S. Cl. 95—64 R **5 Claims**



An improved coupling assembly is provided for coupling the exposure meter to an aperture ring of an interchangeable objective lens in a single-lens reflex camera to correct the exposure calculating mechanism in response to the maximum aperture of a lens utilizing the TTL full-aperture exposure measuring method. The correction about the maximum aperture of the lens mounted is automatically made to the exposure calculating mechanism of the built-in exposure meter of the camera when the lens is mounted with its aperture being maintained at maximum opening.

3,699,869

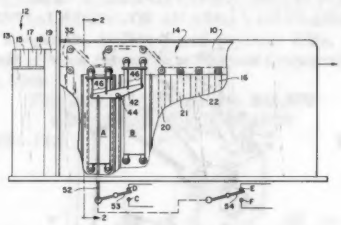
FILM PROCESSING APPARATUS FOR PROCESSING FILMS OF DIFFERENT TYPE

Einar W. Jensen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1970, Ser. No. 61,594

Int. Cl. G03d 3/12

U.S. Cl. 95—94 R **10 Claims**



A processing apparatus having two chambers, one for properly processing a film of one type or ASA number, and the other for properly processing a film of a different ASA number or type. Each of the processing chambers is provided with a film supporting rack movable between an enabled position, in which the rack transports film, and a disabled position in which the film is not transported. Each chamber further has processing solution circulation, replenishment and temperature control systems. The film racks in the two processing chambers are coupled together such that movement of a rack in any one processing chamber to its enabled position results in movement of the rack in the other processing chamber to its disabled position. Once the threaded rack is moved to its enabled position and the processing apparatus threaded through all of its stations for properly processing a film of a predetermined type, an interlock system is actuated for (1) accepting for introduction into the processing apparatus only film of the predetermined type and rejecting all other types of film, and (2) activating recirculation, temperature control and replenishment systems for only the processing solution being used.

3,699,870

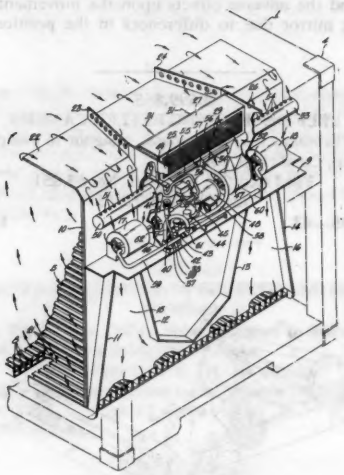
APPARATUS FOR TRANSPORTATION OF COMMODITIES

Raymond E. Cantagallo, Drexel Hill, and Robert J. Lutz, Swarthmore, both of Pa., assignors to Sun Shipbuilding & Dry Dock Company, Chester, Pa.

Continuation of Ser. No. 834,281, June 18, 1969, abandoned. This application June 23, 1971, Ser. No. 156,124

Int. Cl. B60h 1/24

U.S. Cl. 98—10 **6 Claims**



Large insulated containers are used for the transport of chilled or frozen commodities. Each of the containers has its own electric-motor-driven refrigeration equipment, which is supplied with electric power from the ship or trailer chassis on which the containers are being transported. In the containers, a continuous flow of refrigerated (or, in some cases, heated) air is maintained up through and/or around the packaged commodity. Means is provided to change the atmosphere inside the container by the addition of fresh air. A temperature set point adjustment is provided to maintain the temperature of the air being circulated in the container. A relatively simple and convenient arrangement is provided for mounting the refrigeration equipment on the container.

3,699,871

SUPPLY AIR DEVICE FOR INJECTION OF PREFERABLY COLD VENTILATION AIR

Birger Larkfeldt, Barnarp/Jonkoping, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Stockholm, Sweden

Filed Feb. 26, 1971, Ser. No. 119,091

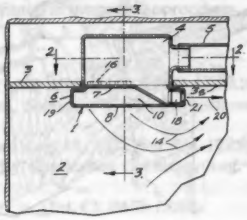
Claims priority, application Sweden, Feb. 26, 1970, 2478/70

Int. Cl. F24f 13/06

U.S. Cl. 98—40 D **6 Claims**

An air supply device adapted to be mounted adjacent one edge of a hung ceiling for injecting cold air from a duct extending parallel to the ceiling surface above the hung ceiling. The device consists of a pressure box having an air distribution chamber in its bottom formed between a pair of perforated plates which operate to distribute the air vertically downward and eliminate any horizontal component generated in the duct. To avoid the fouling of the ceiling surface surrounding the distribution chamber and the room wall adjacent the edge

of the ceiling by the dirty secondary room air, air flow gaps are provided on three sides of the distribution chamber to inject air streams substantially parallel to the ceiling surface radiating outwardly from the distribution chamber, the outward



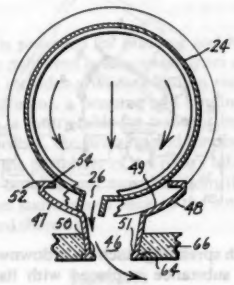
flow deflecting the downwardly directed air by ejection and away from the room wall. Air flow regulating means are provided in each gap and in the distribution chamber to insure mixture of the air with secondary room air so as to avoid the draughts normally experienced from cold air inlet grilles.

3,699,872

AIR DISTRIBUTION APPARATUS

Michael H. Kruger, Chestnut Hill, Mass., assignor to Keene Corporation

Filed March 1, 1971, Ser. No. 122,611
Int. Cl. F24f *13/06*
U.S. Cl. 98—40 D **18 Claims**



Air distribution apparatus including an air distributor designed for connection to ductwork in a building and adapted to be mounted flush with a ceiling. The distributor contains an adjustable plenum chamber rotatable about its axis for selectively determining the quantity and directing air through its outlet angularly outward in any direction into a room without using dampers or other air deflecting or directing vanes. The absence of dampers or other members in the air stream minimizes air turbulence and sound noises while increasing the overall efficiency of the distributor.

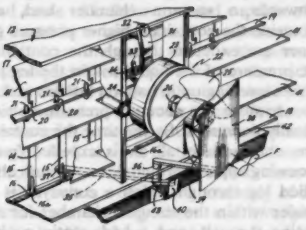
3,699,873

AIR FLOW CONTROL APPARATUS

Albert H. Irvin, Richmond, Ind., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed June 14, 1971, Ser. No. 152,886
Int. Cl. F04d *25/08*; F01d *7/00*, *17/12*
U.S. Cl. 98—116 **5 Claims**

Air flow control apparatus for a room air conditioner includes oscillatable louvers for directing air discharged from the air conditioner in a sweeping motion throughout the space being conditioned. Power for oscillating the louvers is derived from a turbine device positioned in the stream of air caused to flow through the air conditioner. The sweep rate of the oscillatable louvers is controlled by a movable shield located in the air stream in advance of the turbine device, and selectively positionable to vary the quantity of air flowing over the turbine vanes. The shield includes a tab, which upon movement



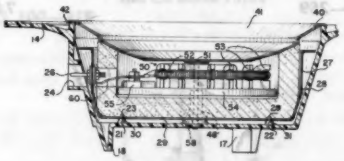
of the shield to the lowest turbine speed position, engages a turbine vane to halt rotation of the turbine device, thereby stopping oscillating movements of the louvers.

3,699,874

POPCORN POPPER

Ervin F. Dusek, Villa Park, Ill., assignor to Reliable Manufacturing Corporation, Franklin Park, Ill.

Filed Nov. 20, 1970, Ser. No. 91,460
Int. Cl. A23l *1/18*
U.S. Cl. 99—238.1 **10 Claims**



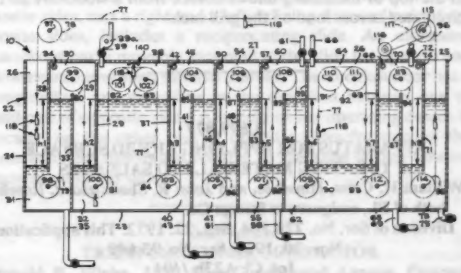
An improved popcorn popper having an improved insulating means which facilitates more uniform heating while reducing heat losses. Assembly of the heating element as an integral unit into the base is also facilitated.

3,699,875

APPARATUS FOR PRESERVING DELICATE FOOD PRODUCTS

Donald C. Wilson, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed May 3, 1971, Ser. No. 139,648
Int. Cl. B65b *55/06*
U.S. Cl. 99—249 **7 Claims**



Delicate food products having substances that become volatile when subjected to sterilization heat can be preserved in flexible containers without loss of aroma or flavor by expelling air at room temperature from the food product and container, then sealing the container and sterilizing the

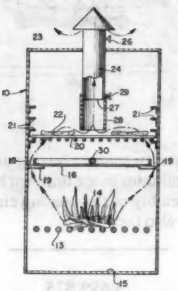
product therein. Each container is filled with a food product and has an opening through which gases can be expelled while preventing liquid from entering. These containers are advanced by a conveyor through a liquid filled leg in an enclosed housing towards a vacuum chamber and, as pressure decreases outside the container, higher pressure gases within the container are expelled through the container opening. Hydrostatic pressure of the liquid within the leg prevents the container from swelling up in balloon fashion and, as the container moves towards the vacuum, pressure outside the container gradually decreases. By the time the container reaches the vacuum, substantially all air is expelled from the container. Processing apparatus includes a vacuum chamber with a liquid filled leg through which a conveyor is adapted to travel, a sealer within the vacuum chamber for sealing containers passing through, and a hydrostatic cooker through which the conveyor passes for sterilizing food products in the sealed containers.

3,699,876

COMBINED CHARCOAL GRILL AND PIT BARBECUE COOKER

Clarence E. Ellis, 724 Monument Road, Ponca City, Okla.

Filed Aug. 9, 1971, Ser. No. 170,041
Int. Cl. A47j *37/00*; A24b *3/00*
U.S. Cl. 99—259 **7 Claims**



A common casing encloses an ash pit and grate for a pit-type barbecue cooker and an overhead pan for drippings or for the support of charcoal when the device is utilized as an outdoor charcoal grill. An adjustable grill rack is mounted in the casing above the pan and an adjustable stack with damper in the top of the casing allows smoke from a wood fire to be circulated across food on the grill rack.

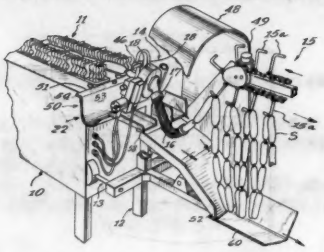
3,699,877

APPARATUS FOR APPLYING LIQUID SURFACE TREATING MATERIALS TO SAUSAGES

William H. Criss, Hinsdale, and John R. Shackleford, Roselle, both of Ill., assignors to Stange Co.

Division of Ser. No. 228,104, Feb. 22, 1972. This application Nov. 30, 1970, Ser. No. 93,609
Int. Cl. A23b *1/04*
U.S. Cl. 99—260 **12 Claims**

Apparatus for applying liquid surface treating materials to a linked string of sausages in a continuous cellulose casing immediately after stuffing and linking and before any other processing occurs. As the linked string of sausages moves in a predetermined path it is subjected to a spray consisting of a liquid surface treating material, the liquid being delivered under pressure to a spray head from a supply tank by a pump



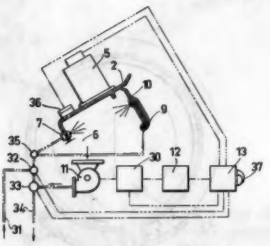
in substantial excess of the quantity required for surface treatment, and the excess liquid being returned to the tank.

3,699,878

WASHING MEANS FOR A SANDWICH SPREADING MACHINE

Bengt Karl-Axel Westberg, Nynashamn; Tor Axel Odman, and Rune Fahlstrom, both of Stockholm, all of Sweden, assignors to Fahlstrom AB, Stockholm, Sweden

Filed Sept. 28, 1970, Ser. No. 76,103
Int. Cl. B08b *3/00*
U.S. Cl. 99—450.4 **9 Claims**



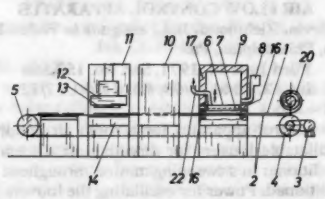
In a sandwich spreading machine, a downwardly open vessel for spreading substance is placed with its mouth above a closed casing having a waste receiving opening. In the slot between said mouth and said opening a track for advanced bread are placed. Waste from spreading substance and bread are collected in the casing, which is provided with inlet for liquid and outlet therefor and for the waste. The substance vessel is detachable from the casing for separate washing.

3,699,879

DEVICE FOR FURNISHING VITAL AND COSTLY FOOD WITH ORNAMENTS AND WRITING

Ulrich Ritzer, Claudiaplatz 1, 6020 Innsbruck, Austria

Filed Feb. 6, 1969, Ser. No. 796,973
Int. Cl. A23g *3/20*
U.S. Cl. 99—450.1 **10 Claims**



A device for furnishing vital and costly food with ornaments and writing, preferably pastries, by way of screen printing, by

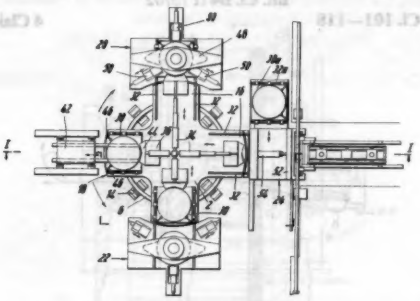
means of a viscous printing paste prepared of vital or costly food, the ornaments or writing being first applied onto an edible, flat support by utilizing a temperature controllable screen, said support being subsequently applied onto the food or as a negative onto a thin foil and being then transferred onto the support to be printed in the transfer process.

3,699,880

WIRE AND ROD HANDLING APPARATUS

Norbert Nuckel, Solingen, Germany, assignor to Friedrich Kocks

Filed Aug. 19, 1971, Ser. No. 172,977
Claims priority, application Germany, Aug. 19, 1970, P 20 41 181.8
Int. Cl. B65b *13/02*
U.S. Cl. 100—7 10 Claims



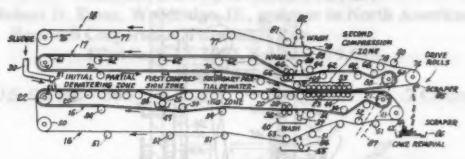
An apparatus is provided for pressing and binding bundles of wire which are delivered in succession from a loop collector which apparatus includes a loading station receiving bundles from the loop collector, a pressing and binding station and a discharge station, a rotary table for transporting bundles from one station to another, the pressing and binding station being disposed outside the periphery of the rotary table and carriage means receiving bundles and movable from the rotary table into the individual stations and back to the rotary table when the latter is aligned therewith.

3,699,881

SLUDGE DEWATERING APPARATUS

Paul Levin, Morton Grove, and Maximilian Adamski, Wheeling, both of Ill., assignors to General American Transportation Corporation

Filed July 26, 1971, Ser. No. 166,086
Int. Cl. B30b *9/24*
U.S. Cl. 100—118 16 Claims



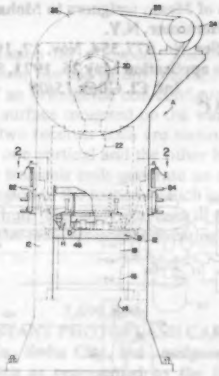
An apparatus for removing aqueous liquid having a lower content of solids, if any, from a flowable material, containing aqueous liquid as a continuous phase and suspended solids as a discontinuous phase, to obtain a product having a higher solids content, has two endless, driven belts of elongated porous sheets. The belts are supported so that one belt has its path of travel inside that of the other belt. The outer belt is supported so that it has an upper horizontal run through three zones. The inner belt is moved in the same direction and has upper horizontal runs through the first and third of those zones. At the intermediate zone the belt moves downwardly and then upwardly. The outer belt overlies and abuts the inner belt at the first and third zones and is spaced from it at the intermediate zone. The sheet of the inner belt is resilient, compressible and made of cellular material capable of absorbing an aqueous liquid by a wicking action, whereas the sheet of the outer belt is a fine-mesh sheet with pores providing passage of the liquid through the sheet by the wicking action of the abutting cellular sheet of the inner belt while most of the solids are retained on the outer belt. A feeder for delivering flowable material on to the outer belt is mounted adjacent the beginning of the first zone. At the intermediate zone a pair of opposed rolls compress the inner belt to remove aqueous liquid. The inner belt is a composite assembly of the sheet of cellular material, a backing sheet and overlying strands secured to the backing sheet at widely spaced locations to avoid affecting substantially the planarity of the outer surface of the sheet of cellular material.

3,699,882

KNOCKOUT BAR ASSEMBLY FOR PRESSES

Harry E. Keithley, Battle Creek, and Robert A. Heirigel, Hastings, both of Mich., assignors to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed July 2, 1971, Ser. No. 159,219
Int. Cl. B30b *15/32*
U.S. Cl. 100—218 11 Claims



A press having a front and a back defining a first pair of opposite sides, and a right and a left defining a second pair of opposite sides, includes a reciprocating slide. An elongated knockout bar is movably mounted in the slide for upward and downward movement relative thereto. The knockout bar has a longitudinal axis extending in the direction between one of said pair of opposite sides. A knockout bar operating device is located on the other pair of opposite sides for moving the knockout bar downward relative to the slide during upward movement of the slide.

3,699,883

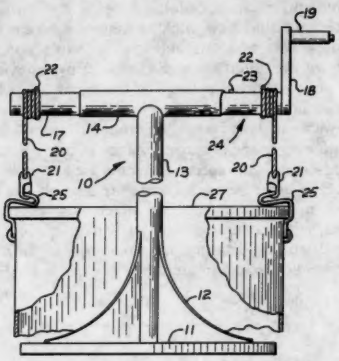
TRASH CONTAINER COMPACTOR

Donald B. Wiebe, 1529 East Candlewood Avenue, Orange, Calif.

Filed April 19, 1971, Ser. No. 135,175
Int. Cl. B30b *1/00*
U.S. Cl. 100—227 4 Claims

A trash container compactor, which is adaptable to most common trash containers, provides a feature which produces

a crushing force capable of increasing the storage capacity of a container by a factor several times its normal capacity, depending upon the type of refuse within the container. The



compactor also provides the option of using a simple tamping method to increase the container volume intermittently, as refuse is inserted, when high compression is not a requirement.

3,699,884

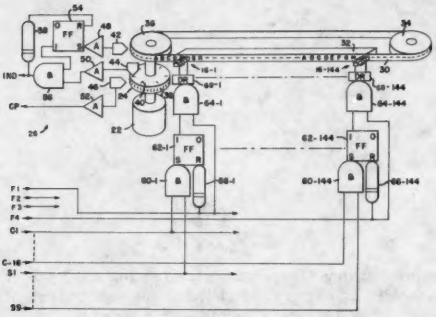
CONTROL FOR CHAIN PRINTER

Lynn W. Marsh, Jr., Melrose, and Edward M. Schneiderhan, Billerica, both of Mass., assignors to Mohawk Data Sciences Corporation, Herkimer, N.Y.

Division of Ser. No. 877,354, Nov. 17, 1969, Pat. No. 3,629,861. This application May 26, 1971, Ser. No. 146,943

Int. Cl. G06k *15/08*

U.S. Cl. 101—93 C **3 Claims**



A control system for a horizontal type carrier, or "chain", printer wherein a recirculating shift register memory is employed to store the code representations of characters to be printed on the print line. A tracking or address counter is advanced in synchronism with the movement of data through the shift register and serves to identify each character stored therein with the particular print position in which it is to be printed. Generation of print command signals is accomplished by comparing, in sequence, each character stored in the memory with the output of a character generation counter which is advanced in synchronism with the movement of the type carrier to identify the order in which the types on the carrier move past the print positions. Actuation of the comparator and advancement of the character generation counter are controlled directly by the output of the tracking counter. Beginning-of-font sync pulses are generated by gating a primary index signal derived directly from the type carrier with a secondary index signal derived from a rotating code disc. A plurality of index marks are provided on the code disc in a manner to enable generation of properly timed beginning-of-font signals for any of a variety of different font length type carriers interchangeably employable in the printer.

3,699,885

SCREEN PRINTING MACHINE WITH TRANSPORT BAND FOR TEMPORARILY ADHESIVELY SECURING WEB DURING PRINTING

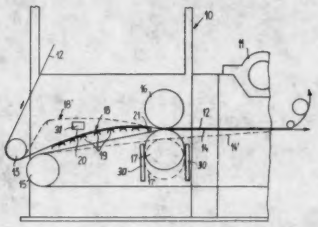
Hans Thierstein, Holzacker, Switzerland, assignor to Fritz Buser AG Maschinenfabrik, Wiler by Utzenstorf, Switzerland

Filed April 27, 1970, Ser. No. 32,123

Claims priority, application Switzerland, May 2, 1969, 6749/69

Int. Cl. B41f *13/02*

U.S. Cl. 101—118 **4 Claims**



A screen printing machine, especially a rotary screen printing machine, which is of the type wherein the material to be printed upon is delivered to a transport band and by the addition of heat and pressure is temporarily secured by means of a thermoplastic adhesive carried by the transport band to such transport band, until the material, after passing the color applying mechanism, is removed from the transport band so as to undergo further treatment. According to an important aspect of the invention, a heat source is arranged over a partial length of the transport band coated with the thermoplastic adhesive, this heat source being situated forwardly of the contact location of the material to be printed upon and the transport band.

3,699,886

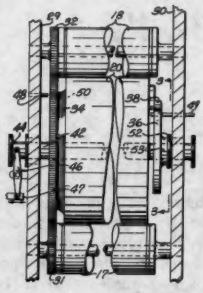
DISCONNECT ARRANGEMENT FOR MULTI-UNIT PRINTING PRESS

Norman K. Henkel, Dayton, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed April 2, 1971, Ser. No. 130,713

Int. Cl. B41f *7/06*

U.S. Cl. 101—183 **4 Claims**



A disconnect arrangement for a multi-unit sheet fed press in which the transfer cylinder, together with its grippers, gripper cam and followers, are shifted axially out of mesh with the gears on adjacent impression cylinders thereby interrupting

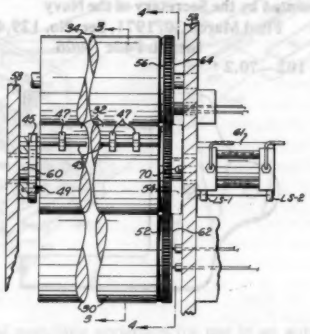
the press drive train and permitting individual operation of the units. The disconnected transfer cylinder is locked in a predetermined angular relationship relative to the adjacent cylinders with the transfer cylinder gaps facing the impression cylinders so that the grippers on the impression cylinders can open into the gaps as the units are individually rotated.

3,699,887

DISCONNECT ARRANGEMENT FOR MULTI-UNIT PRINTING PRESS

Donald L. Southam, Brecksville, and Thomas J. Kacmarcik, Parma Heights, both of Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed April 2, 1971, Ser. No. 130,708
Int. Cl. B41f 7/06
U.S. Cl. 101—183 **23 Claims**



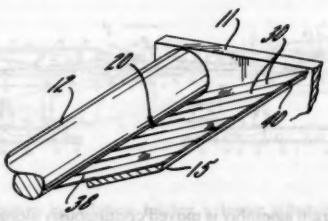
A disconnect arrangement for a multi-unit sheet feed press in which the transfer cylinder gear is shifted axially out of mesh with the gears on the adjacent cylinders thereby interrupting the press drive train and permitting individual operation of the units. Means are provided to prevent disengagement of the cylinder in one rotational position and to maintain the cylinder in a predetermined position after it has been disconnected. Interrupted portions on the transfer cylinder are angularly spaced such that, upon disconnect, these portions are facing the adjacent cylinders and provide a space into which the grippers on the adjacent cylinders can open as the units are individually rotated. Means are also provided to assure that, upon re-engagement, the gears are brought into mesh in exactly the same position they occupied when disconnected.

3,699,888

COMPOSITE FOUNTAIN BLADE CONSTRUCTION FOR REMOTE INK CONTROL SYSTEM

Robert D. Easoz, Woodridge, Ill., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Sept. 13, 1971, Ser. No. 179,685
Int. Cl. B41f 31/04
U.S. Cl. 101—365 **7 Claims**



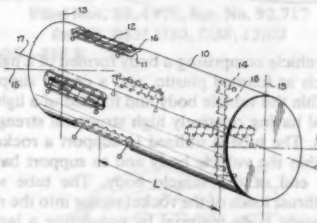
An ink fountain blade assembly which includes a rigid backing member and a plurality of identical blade sections secured to the surface of the backing closely edge to edge and extending cantilever fashion to present a common substantially continuous film-forming edge for presentation to the surface of an associated fountain roller, one lateral edge of each of the blade sections being relieved along its cantilevered portion by an amount which is sufficient to permit freedom of adjusting movement toward and away from the roller but which is less than that which will leak a body of ink supported on the blade sections. Each blade section is chamfered in a rear corner position to provide distinctive visual indication, for assembly purposes of the edge which has been relieved.

3,699,889

COIL CONFIGURATION FOR AN ELECTROMAGNETIC WARHEAD INFLUENCE FIRING SYSTEM

Armand Cioccio, and Gee-in Goo, both of Silver Springs, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed April 27, 1971, Ser. No. 137,907
Int. Cl. F42b 23/26, 21/38
U.S. Cl. 102—18 **12 Claims**



A coil configuration for a torpedo warhead exploder influence firing system for use against surface and submarine targets consists of an orthogonal coil configuration where the transmit coils are surface mounted on the warhead section of the torpedo, and two receiver coils are mounted perpendicular to each other, one vertical and the other horizontal to the torpedo axis. The transmit coils generate an electromagnetic field around the region of the torpedo which induces eddy currents in a nearby hull. The eddy currents in the hull then induce a voltage in the receiver coils, indicating the presence of a ship.

3,699,890

FIRE RESISTANT PHOTOFLASH CARTRIDGE

James E. Short, Jr., Switz City, Ind., assignor to The United States of America as represented by the Secretary of the Navy

Filed May 4, 1971, Ser. No. 140,083
Int. Cl. C06d 1/10, 1/04
U.S. Cl. 102—37.8 **2 Claims**

A fire resistant photoflash cartridge containing a charge of photoflash composition and an electric primer for initiating ig-

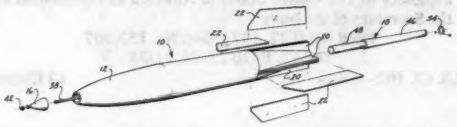
nition of said photoflash composition, the improvement comprising a disk of heating insulating material attached to said cartridge adjacent said electric primer and a heavy layer of intumescent material surrounding the remainder of the cartridge.

3,699,891

ROCKET VEHICLE AND METHOD OF MANUFACTURING SAME

John A. Kreuzer, Mission Viejo, and David E. Thompson, Irvine, both of Calif., assignors to The Susquehanna Corporation, Fairfax County, Va.

Filed April 23, 1969, Ser. No. 818,679
Int. Cl. F42b *13/28*
U.S. Cl. 102—49.3 **13 Claims**



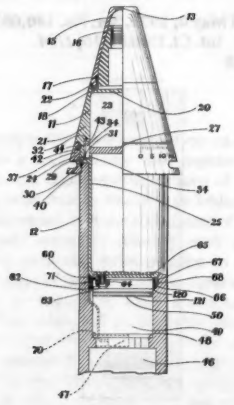
A rocket vehicle comprising a body formed of a lightweight material, such as foamed plastic, and a center support tube mounted within the vehicle body and formed of a lightweight, rigid material having relatively high structural strength, such as aluminum. The tube is utilized to support a rocket motor mounted within the vehicle body and to support ballast and the forward end of the vehicle body. The tube serves to transfer the thrust loads of the rocket motor into the relatively weak lightweight body material by presenting a large shear surface between the body and the tube. In a preferred method of manufacture, the support tube is positioned within a mold cavity having a configuration complementary with the external configuration of the rocket vehicle body. Foamed material is then introduced into the mold to form the vehicle body about the support tube.

3,699,892

CONTROLLED VARIABLE TIME RADIO PROXIMITY FUZE

John C. Kopec; Henry O. Schmitt, Jr., and Frederick H. Tenney, all of Rochester, N.Y., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 20, 1951, Ser. No. 247,462
Int. Cl. F42c *13/04, 13/00, 9/02*
U.S. Cl. 102—70.2 P **19 Claims**



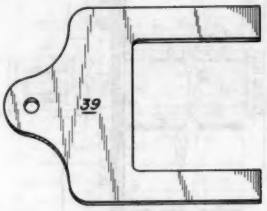
1. In a radio-controlled proximity fuze having a portion adapted to be rotated to set effective target time, a clock within said fuze adapted to be started when a projectile containing said fuze is fired, said rotatable portion being provided with at least two pairs of electrical contacts the first of which is adapted when short-circuited to close an electrical circuit to activate said fuze and the second of which is adapted when short-circuited to maintain said fuze unarmed, and means short-circuiting said second pair during a portion of the flight of the projectile and rotatably driven by said clock for sequentially short-circuiting said first pair and maintaining said electrical circuit closed and removing the short circuit across said second pair after predetermined intervals in flight which are functions of said affective target time.

3,699,893

IGNITION BAND AND COVER ASSEMBLY

Daniel Meraz, Jr., and Anthony J. Simshauser, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed March 30, 1971, Ser. No. 129,436
Int. Cl. F42c *19/06*
U.S. Cl. 102—70.2 **10 Claims**



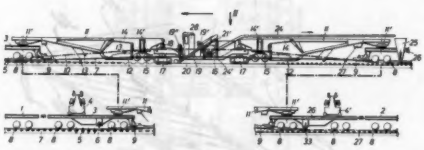
An ignition band and nozzle cover assembly for use on rocket motors. A cover molded from high impact strength plastic is provided with a groove around its outside diameter and recessed areas in its top. An ignition band is positioned within the groove and is provided with a contact band and shorting tab which fit into the recess on the cover top. Removal of the shorting tab unshorts the ignition band and, thus, the rocket motor. To reshorten the rocket motor, a shorting clip is provided which fits beneath the contact band and into the recess in the cover top. The cover assembly protects against dust and/or moisture entering the inside of the rocket motor and acts as a high impact protection for the aft end of the motor by absorbing impact. The ignition and contact bands are also shielded from damage by being positioned within recesses in the cover assembly.

3,699,894

MOVABLE APPARATUS FOR REPLACING AN OLD TRACK BY A NEW TRACK

Franz Plasser, and Josef Theurer, both of Johannesgasse 3, Vienna, 1, Austria

Filed Sept. 23, 1970, Ser. No. 74,710
Claims priority, application Austria, Oct. 7, 1969, 9452/69
Int. Cl. E01b *29/02*
U.S. Cl. 104—2 **18 Claims**



A train assembly is moved continuously along a right of way during a track renewal or replacement operation, with a first train section of cars moving on the old track rails and a second train section of cars moving on the new track rails. In an inter-

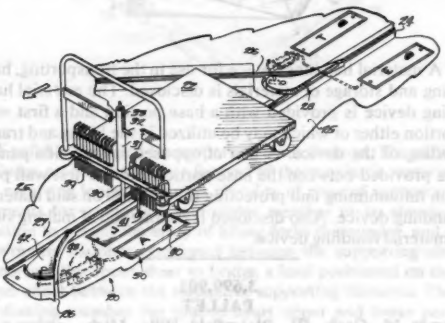
mediate trackless section, the old track is replaced by the new track, and an intermediate train section bridges the trackless section of the right of way. The intermediate train section is pivotally coupled to the first and second train sections, the latter being held at a predetermined distance. Track renewal means operable in a timed sequence during the continuous movement of the train assembly are mounted on the cars.

3,699,895

TRUCK TOW CONVEYOR SWITCHING APPARATUS

Alfred O. Peter, Hatboro, Pa., assignor to FMC Corporation, San Jose, Calif.

Filed May 5, 1971, Ser. No. 140,396
Int. Cl. B61j *3/04*
U.S. Cl. 104—88 **23 Claims**



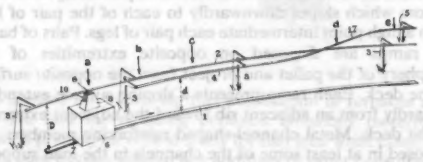
A mechanical switching apparatus for use in an automatic truck tow conveyor system has a switch plate for diverting coded trucks from a main slot in a reference surface to a spur slot intersecting the main slot. Two latched reader heads, located upstream from the switch plate, tension individual flexible cables when contacted by properly located code probes on the truck. Each cable is operatively connected to a motion translator device which, when both reader heads are activated simultaneously, causes the motion translator to move linearly and tension a third flexible cable. The tensioning of this third cable, which is connected to the switch plate, causes the switch plate to rotate from its closed to its open position so the truck is diverted into the spur slot. The motion translator prevents accidental movement of the switch except when two properly coded probes release the two latched reader heads simultaneously.

3,699,896

TRANSPORTATION INSTALLATION WITH A PLURALITY OF STATIONS

Francois L. Giraud, Plaisir, France, assignor to LTV Aerospace Corporation, Dallas, Tex.

Filed June 23, 1971, Ser. No. 155,967
Claims priority, application France, July 6, 1970, 7024984
Int. Cl. E01b *25/26*
U.S. Cl. 104—88 **20 Claims**



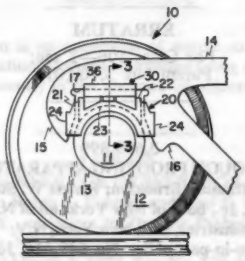
A transportation installation having a lower substantially horizontal conveyor and a guide rail extending parallel to and spaced above the conveyor and a car transportable by the conveyor having a shoe frictionally engageable with the conveyor at its bottom, a guide wheel vertically movably mounted on its upper top end and means for moving the guide wheel upwardly into engagement with the guiderail during movement of the car by the conveyor. The installation includes at least one station to which the car may be switched from the conveyor, each of the stations including a carrier rail having an upstream portion parallel to and spaced below the guide rail, an intermediate portion which is spaced laterally and upwardly from the guide rail, a downstream portion which is parallel to and spaced below the guide rail, and connector portions extending convergently laterally outwardly and upwardly from the upstream and downstream portions to the upstream and downstream ends of the intermediate portions.

3,699,897

RESILIENT BEARING ADAPTERS FOR RAILWAY TRUCKS

James W. Sherrick, Edinboro, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Nov. 25, 1970, Ser. No. 92,717
Int. Cl. B61f *5/30, 5/38, 15/02*
U.S. Cl. 105—218 R **8 Claims**



A railway truck having a resilient pad positioned between the bearing adapter and side frame. The resilient pad includes a body of elastomer in compression load carrying relation between the load carrying surface of the side frame and load receiving surface of the bearing adapter with an upper surface conforming to the load carrying surface and a lower surface conforming to the load receiving surface. The body has integral spaced flanges extending upwardly beyond the upper surface in straddling engagement with the side frame. In addition, the body and bearing adapter includes portions integral therewith providing means interlocking the lower surface of the body relative to the bearing adapter.

3,699,898

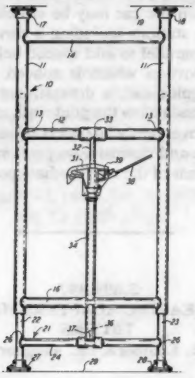
CARGO BULKHEAD

Matthew P. Nolan, Route 1, P.O. Box 673, Antioch, Ill.

Filed Dec. 28, 1970, Ser. No. 101,516
Int. Cl. B60p *7/14*
U.S. Cl. 105—376 **1 Claim**

A H-shaped member having tubular parallel legs and a centrally located cross bar extending between the legs. An assembly of two tubular pieces slidably telescoped in the legs and extends therefrom and includes a cross bar interconnecting the extending ends of the tubular pieces. A jack is connected between the two cross bars for exerting a compressive

force therebetween and thereby forcing outwardly on the opposite ends of the entire unit for bracing the unit between spaced-apart walls or the like to have the unit serve as a bulk-



head for cargo. A third cross bar extends between the legs of the H-shaped member, and the jack extends through the third cross bar and is guided thereby in the extension and contraction of the jack for operating the bulkhead.

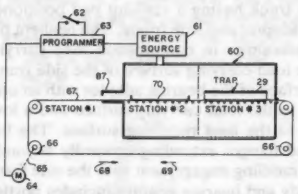
ERRATUM

For Class 106—2 see:
Patent No. 3,700,013

3,699,899
DOUGH PROOFING APPARATUS

Robert F. Schiffmann, Brooklyn; Ernest W. Stein, and Harold B. Kaufman, Jr., both of New York, all of N.Y., assignors to DCA Food Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 649,610, June 28, 1967, abandoned. This application July 1, 1970, Ser. No. 51,545
Int. Cl. H05b *9/06*
U.S. Cl. 107—57 C **46 Claims**

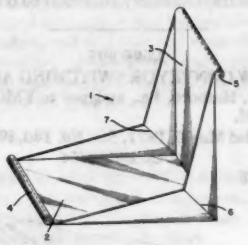


An apparatus including a conveyor for moving cut pieces of yeast-containing dough. The conveyor subjects the dough pieces to at least two microwave heating periods separated by a "rest" period. Alternatively, a similar heating sequence is achieved by appropriately programming a microwave energy source. Typically, the dough pieces are first heated for a period of 5 to 180 seconds to raise the dough temperature to between 90° F. and 120° F. Heating of the dough pieces is then stopped for 20–180 seconds to permit temperature equilibration. Thereafter, the dough pieces are heated again for a period not exceeding 3 minutes to a temperature between 100° F. and 130° F. During both heating intervals, the power density within the microwave cavity, as measured in terms of the heating of "conductivity water," is in the range 0.128–12.4 watts/gm. Such a sequence allows the dough pieces to uniformly rise to an optimum volume in a relatively short time.

3,699,900
MATERIAL HANDLING DEVICE

Eric A. Carlson, 12427 Highlife Drive, Creve Coeur, Mo.

Filed May 26, 1970, Ser. No. 40,675
Int. Cl. B65j *19/38*
U.S. Cl. 108—53 **9 Claims**

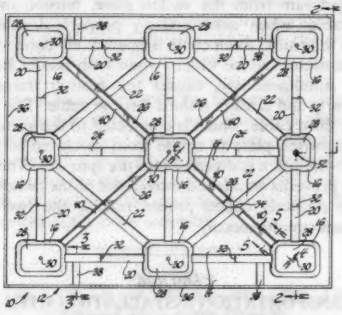


A material handling device for use in the transporting, handling and storage of materials is disclosed. The material handling device is provided with a base portion and a first wall portion either of which may be utilized in the lifting and transporting of the device. A pair of opposed spaced side panels are provided between the base portion and the first wall portion for confining and protecting the material on said material handling device. Also disclosed is the method of making such a material handling device.

3,699,901
PALLET

James M. Cook, III, Bloomfield Hills, Mich., assignor to Oakland Plastics Corporation, Troy, Mich.

Filed July 23, 1970, Ser. No. 57,693
Int. Cl. B65d *19/38*
U.S. Cl. 108—58 **23 Claims**

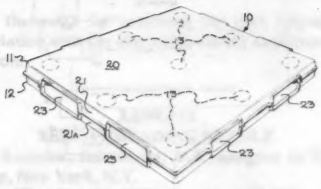


A pallet made of a plastic or organic polymeric material and of a unitary surface having a deck providing a load supporting surface. A plurality of spaced hollow legs project from the opposite surface of the deck. A plurality of hollow ribs project from the same opposite surface to define channels in the load supporting surface. The legs have drain holes in the bottom thereof. Each channel extends between a pair of legs and has a bottom which slopes downwardly to each of the pair of legs from a high point intermediate each pair of legs. Pairs of banding ramps are disposed on opposite extremities of the periphery of the pallet and project from the opposite surface of the deck. Each ramp presents a sloping surface extending upwardly from an adjacent rib toward the adjacent extremity of the deck. Metal channel-shaped reinforcing members are disposed in at least some of the channels in the load supporting surface. A reinforcing platform extends across and is attached to the extremities of the legs in a plurality of rows of legs. The platform includes a runner extending along and attached to the extremities of the legs in each row and a plate interconnecting adjacent runners.

3,699,902
PALLET

Guy H. Allgeyer, Toledo, and James B. Foote, Sylvania, both of Ohio, assignors to Owens-Illinois, Inc.

Continuation-in-part of Ser. No. 867,589, Oct. 20, 1969, abandoned. This application May 5, 1971, Ser. No. 140,575
Int. Cl. B65d *19/38*
U.S. Cl. 108—58 3 Claims

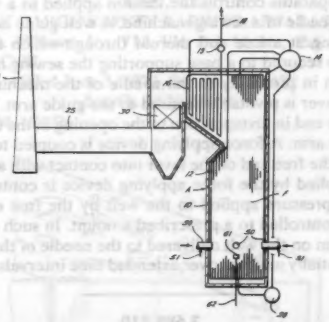


A pallet is provided for supporting loads thereon. The pallet includes an upper member formed of thermoplastic material for receiving loads thereon, a plurality of rows of supporting elements for supporting said upper member in an elevated position to permit the entry of lifting forks thereunder, and a reinforcing member positioned between the supporting elements and the upper sheet to bridge a load positioned on the upper sheet between the respective supporting elements. The reinforcing member has spaced apart upper and lower portions which are interconnected together to permit the reinforcing member to function as a flexural member.

3,699,903
METHOD FOR IMPROVING FUEL COMBUSTION IN A FURNACE AND FOR REDUCING POLLUTANT EMISSIONS THEREFROM

Oliver F. King, 5422 Brae Burn Drive, Bellaire, Tex.

Filed Feb. 25, 1971, Ser. No. 118,836
Int. Cl. F23b *7/00*
U.S. Cl. 110—1 J 10 Claims

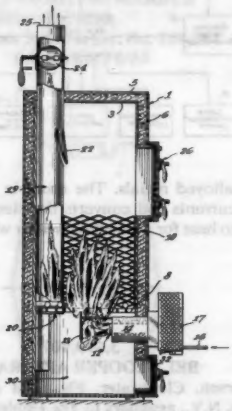


A method for improving fuel combustion in furnaces and the like and for reducing pollutant emissions therefrom, wherein primary air is used solely for fuel feed while commercially pure oxygen without any additives or other constituents is introduced for the combustion of the fuel in regulated amounts so as to provide sufficient oxygen for substantially complete combustion. The oxygen is preferably obtained by separating same from air so that the remaining nitrogen may be used as in inert gas applications.

3,699,904
CREMATOR

Charles W. Brown, 1104 North Snodgrass; Marion D. Biller, North Webster Street, and Jerry F. Breuel, Langleville Road, all of Taylorville, Ill.

Filed Sept. 1, 1970, Ser. No. 68,614
Int. Cl. F23g *5/12*
U.S. Cl. 110—8 C 4 Claims

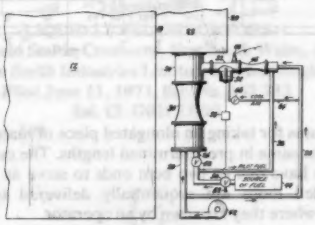


This invention is an apparatus of simple and inexpensive design for cremation of animal carcasses using a single burner to cremate efficiently in the absence of objectionable smoke and odor levels.

3,699,905
BURNER FOR INCINERATOR

Francis X. Gach; Ralph E. Fanton, and Noel D. Hazzard, all of Wellsville, N.Y., assignors to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed March 3, 1971, Ser. No. 120,413
Int. Cl. F23g *5/12*
U.S. Cl. 110—8 A 7 Claims



An incinerator having a pilot burner indicating safety control means that responds rapidly to a change of temperature therein to shut off all fuel flow when the flame is extinguished. This safety control means precludes the collection of unburned fuel in a manner that presents extreme fire and explosion hazards.

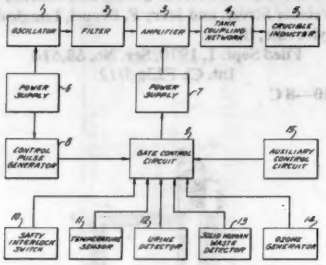
3,699,906
POLLUTION CONTROL SYSTEM

Carl Gallo, Scarsdale, N.Y., assignor to American Pollution Control Corporation, Scarsdale, N.Y.

Filed March 23, 1971, Ser. No. 127,171
Int. Cl. F23g *5/10*
U.S. Cl. 110—8 E 2 Claims

A pollution control system in which continuous-wave radio-frequency generator is coupled to a radio-frequency power

amplifier. The power amplifier is electrically coupled to an inductor surrounding a crucible made of sintered metal compounds or alloyed metals. The crucible is resistive to radio frequency currents and converts the electrical energy of the inductor into heat for converting matter within the crucible.

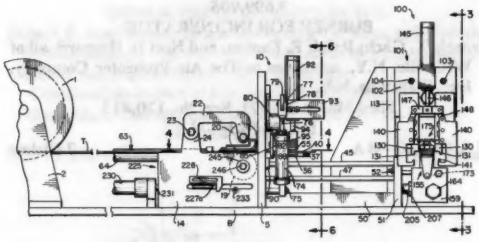


3,699,907

BELT LOOPER APPARATUS

Sven Anderson, Clearwater, Fla., and Anthony Lombardo, Bayshore, N.Y., assignors to The Duplan Corporation, Winston-Salem, N.C.

Filed Oct. 30, 1970, Ser. No. 85,581
Int. Cl. D05b *23/00*
U.S. Cl. 112—121.27 **30 Claims**



Apparatus for taking an elongated piece of material and for cutting the same in predetermined lengths. The cut pieces are folded to have one or two bent ends to serve as a belt loop. The folded loops are sequentially delivered to a sewing machine where they are sewn by an operator.

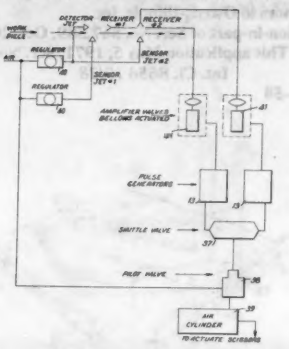
3,699,908

FLUID SENSING CUTTER CONTROL

Joseph M. Hoffee, 725 Sixth Avenue, New York, N.Y.

Filed April 1, 1971, Ser. No. 130,137
Int. Cl. D05b *37/04*; F15c *1/12*
U.S. Cl. 112—130 **10 Claims**

A pneumatic control device suitable for activating a shear and for attachment to a sewing machine employs two sensing air jets in a shoe and block combination, the shoe and block being spaced apart for the reception of work material. The distances between the sensing jets and the shear are separately adjustable, either continuously or step-wise. A shuttle valve and pulse generators are so arranged that interruption of the first jet by work material causes a first cutting stroke of the shear and essentially immediate retraction of the shear to a rest position, and so that restoration of the second sensing jet resulting from removal of the work material causes a similar second cutting stroke.

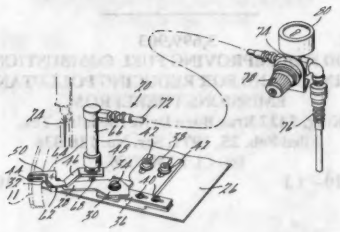


3,699,909

WELT TENSION APPARATUS

Walter J. Gawel, Warren, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 24, 1971, Ser. No. 146,340
Int. Cl. D05b *35/06*
U.S. Cl. 112—152 **10 Claims**



The apparatus controls the tension applied to a welt being fed to a needle of a sewing machine. A welt guide arm, having an opening at a free end thereof through which the welt is passed, is secured to a base supporting the sewing machine at a position in proximity to the needle of the machine. A welt tension lever is pivotably secured to the guide arm. This lever has a free end in juxtaposition to the opening in the free end of the guide arm. A force applying device is coupled to the lever to move the free end of the lever into contact with a welt. The force applied by the force applying device is controllable so that the pressure applied to the welt by the free end of the lever is controlled to a prescribed amount. In such a manner, the tension on the welt delivered to the needle of the machine is substantially uniform over extended time intervals.

3,699,910

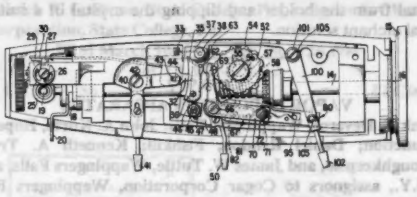
CAM SELECTOR MECHANISMS FOR SEWING MACHINES

John A. Urciola, South Bound Brook, and Walter H. W. Marsh, Fanwood, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Aug. 16, 1971, Ser. No. 171,935
Int. Cl. D05b *3/02*
U.S. Cl. 112—158 A **3 Claims**

A cam selecting machine for a zigzag sewing machine needle jogging mechanism in which a single control block is

formed with not only camming means for shifting a cam follower relatively to a cam stack, but also with camming means



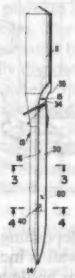
correlated therewith for removing the cam follower out of tracking relation with the cam stack during each cam selecting manipulation.

3,699,911

SELF-THREADING NEEDLE

Stanley J. Ketterer, Jamesburg, N.J., assignor to The Singer Company, New York, N.Y.

Filed Oct. 29, 1971, Ser. No. 193,820
Int. Cl. D05b *85/02*
U.S. Cl. 112—224 **4 Claims**



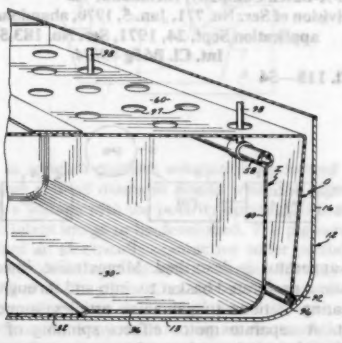
A sewing machine is disclosed in which a threading slot is provided along the needle blade and opening into the needle eye. This needle, which may be fabricated using conventional milling and grinding machinery, provides a self-threading needle eye construction which will deter re-entry of the thread into the threading slot once the thread has been drawn into the needle eye.

3,699,912

BULK CARGO SAFETY BARRIER APPARATUS

Thomas B. Wilson, Jr., 712 Via Del Monte, Palos Verdes Estates, Calif.

Filed June 7, 1971, Ser. No. 150,422
Int. Cl. B63b *25/08*
U.S. Cl. 114—74 R **8 Claims**



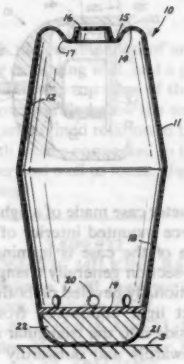
Apparatus for confining a bulk cargo, such as oil, within the hull of a ship should such hull be ruptured as by a collision or grounding. The apparatus includes inner and outer barriers of a form-sustaining but flexible liquid-tight material. Upon deformation of the ship's hull, the panels can be deflected without rupturing, and the adjoining panels of such barriers will sealingly interengage so as to prevent leakage of the bulk cargo contained within the hull.

3,699,913

SELF-RIGHTING MARKER

Willis T. Sautbine, Waterville, Mich.

Filed June 3, 1971, Ser. No. 149,462
Int. Cl. E01f *9/10*
U.S. Cl. 116—63 P **4 Claims**



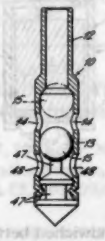
An upright marker for use in designating a selected spot on a floor or ground surface and having a weighted base with a rounded bottom to automatically return the marker to its uprights condition when knocked or blown over. The marker has colored walls which diverge in their upward extension from the base for greater visibility and the upper half of the marker may have the reverse shape of the lower half to allow the upper to be collapsed into the lower half for stacking of the markers.

3,699,914

LIQUID LEVEL INDICATORS

Terry Reginald Smith, Cremorne, New South Wales, Australia, assignor to Smith Industries Limited, London, England

Filed June 11, 1971, Ser. No. 152,212
Int. Cl. G01f *23/00*
U.S. Cl. 116—118 **7 Claims**



An indicator for detecting the sufficiency or insufficiency of oil level in the sump of a vehicle engine, wherein detection is dependent upon the creation of a vacuum between a ball valve device within the engine and an external vacuum source. If the oil level is sufficient, operation of the vacuum source causes the ball to close the valve device whereby the required

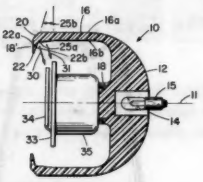
vacuum is created and detected. If the oil level is insufficient, the valve device remains open, even if the vacuum source is operated (that is, the ball stays off its valve seat) so that the required vacuum is not created and this fact can be detected upon operation of the vacuum source.

3,699,915

UNIFORMLY ILLUMINATED METER INDICATOR

William H. Greene, Pompano Beach, Fla., assignor to The Bendix Corporation, Ft. Lauderdale, Fla.

Filed May 19, 1971, Ser. No. 144,946
Int. Cl. G01d *11/28*
U.S. Cl. 116—129 L **4 Claims**



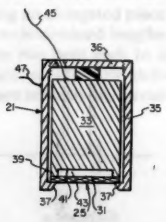
A cup-shaped meter case made of a light conductive material has a light source mounted interior of the bottom surface thereof. The edge of the case is terminated in an inwardly directed, in cross-section generally triangular, rim. The edge of the case is additionally beveled on both the inner and outer surfaces to direct light conducted from the light source through the case side into the triangular rim from where it is dispersed both inwardly and outwardly of the case to illuminate a dial suitably located outwardly of the rim and to illuminate a meter plate and needle located inwardly of the rim. In one alternate embodiment the case side is shown separated from the case bottom so that the rim may be rotated with respect to the light source. In a further embodiment a separate dial plate is shown fitted over the rim and rotatable thereon.

3,699,916

APPARATUS FOR MONITORING OF THE DEPOSITION OF METALLIC FILMS

Desmond F. Sheahan, San Carlos, and George C. Callander, Palo Alto, both of Calif., assignors to GTE Automatic Electric Laboratories Incorporated

Filed Aug. 5, 1970, Ser. No. 61,154
Int. Cl. B05c *11/00*
U.S. Cl. 118—9 **2 Claims**



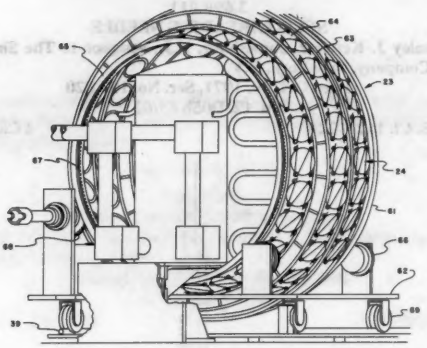
A blank crystal is sandwiched between two electrodes in a holder in a manner such that the only contact of the electrodes with the crystal is along the outer circumference of the crystal. A preliminary evaporation of metal onto the exposed surface of the crystal establishes the desired initial resonant frequency of the crystal. A substrate is then placed in the evaporation chamber proximate the crystal and a metal film is vapor deposited on the substrate and crystal until the resonant frequency of the crystal changes by a predetermined amount. The crystal holder is designed to provide easy removal of the crystal therefrom, thereby facilitating reclamation of the crystal after metal film buildup thereon by removing the crystal from the holder and dipping the crystal in a suitable metal etchant solution.

3,699,917

VAPOR DEPOSITION APPARATUS

Frank T. Deverse, Wappingers Falls; John A. Kurtz, Hopewell Junction; Daniel Rendon, Fishkill; Kenneth A. Trahn, Poughkeepsie, and James W. Tuttle, Wappingers Falls, all of N.Y., assignors to Cogar Corporation, Wappingers Falls, N.Y.

Filed Oct. 2, 1970, Ser. No. 77,453
Int. Cl. C23c *13/08*
U.S. Cl. 118—49 **8 Claims**



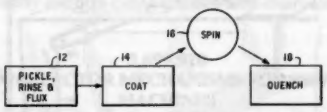
Apparatus for vapor depositing solder onto the terminal areas of semiconductive wafers includes an evacuable rectangular cabinet. A source for holding the solder and for providing heat thereto to cause evaporation thereof is cantilevered from the rear wall of the cabinet. The wafers to be coated are held within mask assemblies on a rotatable dome assembly. The dome is made up of a plurality of wire rings arranged in a plurality of wafer carrying tiers. A cooling shield surrounds the source. During operation the wafers are rotated about the source. Each wafer is exposed to evaporant approximately one-sixth of each cycle and the remaining time is cooled by radiation. Evaporant trim tabs between source and dome assure uniform distribution of solder on all wafers, regardless of tier location.

3,699,918

GALVANIZING APPARATUS

William H. Garrison, Richmond, Va., assignor to American Spin-A-Batch Company, Richmond, Va.

Division of Ser. No. 771, Jan. 5, 1970, abandoned. This application Sept. 24, 1971, Ser. No. 183,539
Int. Cl. B65g *49/04*
U.S. Cl. 118—54 **21 Claims**



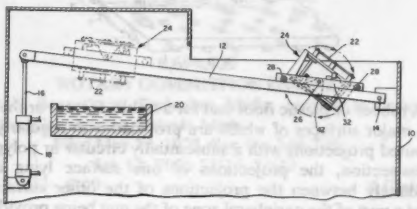
An apparatus is described. Means raise, lower, spin and translate a perforated basket to, into and through a sequence of treating stations to galvanize articles supported in the basket. A separate motor effects spinning of the basket. This motor is independent of any means to raise, lower, translate or support the weight of such basket.

3,699,919

APPARATUS FOR LEVELING SOLDER IN HOLES OF PRINTED CIRCUIT BOARDS

Frederick E. Coffman, State College, Pa., assignor to Chemcut Corporation, State College, Pa.

Filed March 16, 1971, Ser. No. 124,804
Int. Cl. B05c *11/12*
U.S. Cl. 118—56 11 Claims



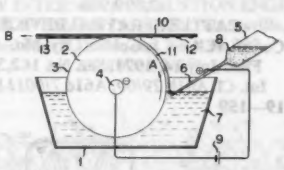
Apparatus for heating printed circuit boards to melt solder overlay and, while solder overlay is in melted condition, orbiting the board rapidly in its plane to level solder on the interior sidewalls of the terminal holes. The circuit board is held on a planar member which is mounted by eccentric bearings on a shaft or shafts symmetrically disposed and driven in unison by timing pulleys and a timing belt. Preferably, a melted liquid bath is used to heat the circuit board, which is immersed in the bath then removed to cool. To facilitate loading and unloading, the circuit board is preferably mounted on a planar mounting member which is rotatable so that the circuit board is below the mounting member during the heating and solder leveling operation but which can be rotated so that the circuit board is above the planar mounting member for loading and unloading. Preferably also, the flexible shafts further include counterweights to balance the inertia of the circuit board and planar mounting member during its circular movement.

3,699,920

ELECTRONOGRAPHIC COPYING MACHINE

Walther Bernt Fried Von Grabe, Koenigstein, Germany, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed May 26, 1969, Ser. No. 827,715
Claims priority, application Japan, March 12, 1968, 43/16138
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 3 Claims



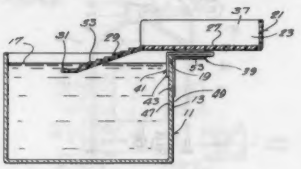
A device in which a pigment solution is discharged into a carrier through a small diameter nozzle while the pigment is applied with a voltage with the polarity opposite to that of an electrostatic latent image to be developed. The pigment is attracted toward an electrically conductive roller partially immersed in a carrier and applied with a voltage with the polarity opposite to that of the pigment so that the pigment is transported by the roller above the level of the carrier into contact with the surface of a copy sheet having an electrostatic latent image formed thereupon at the uppermost portion thereof, whereby the electrostatic latent image is developed.

3,699,921

AQUARIUM PLATFORM

Mark A. Janicek, 2301 East Bellview Place, Milwaukee, Wis.

Filed March 24, 1970, Ser. No. 22,226
Int. Cl. A01k *63/00*
U.S. Cl. 119—5 9 Claims



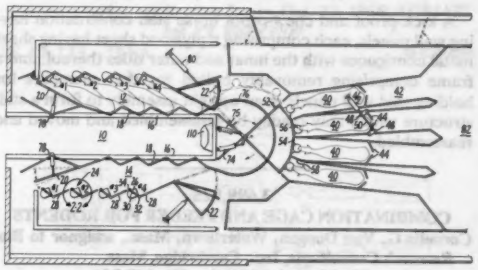
Disclosed herein is the combination of an aquarium having a generally vertically extending wall, and a platform having an upper portion straddling the top edge of the wall and a ramp portion extending downwardly below the top edge of the wall and into the tank in an inclined relation to the upper platform portion, together with means connected to the upper platform portion and to the vertical wall to locate the platform in overlying relation to the wall.

3,699,922

AUTOMATIC MILKING BARN

William Z. Holm, Petaluma, Calif., assignor to Holm Tractor & Equipment Company, Petaluma, Calif.

Continuation of Ser. No. 730,818, May 21, 1968, abandoned.
This application Aug. 10, 1970, Ser. No. 62,714
Int. Cl. A01j *05/00*
U.S. Cl. 119—14.03 3 Claims



A herringbone milking parlor having automatic controls for preparation and movement of milking cows, stall adjusting means for accommodating cows of different size in a single herringbone stall, and a swinging sector gate for transferring a group of cows in sequence from a group of preparation stalls to a herringbone milking stall.

3,699,923

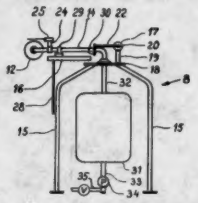
MILKING SYSTEM

Sven O. E. Strom, Huddinge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed May 7, 1971, Ser. No. 141,267
Claims priority, application Sweden, May 8, 1970, 6348/70
Int. Cl. A01j *09/00*
U.S. Cl. 119—14.04 3 Claims

Milking platforms for respective cows are each provided with a teat cup cluster of milk receiving vessel hermetically connected to the cluster, the platforms being movable in unison along a closed path or circuit while the cows are being milked to supply the respective receiving vessels. The platforms move successively past an emptying station comprising a pipeline swingable about the center of an arcuate portion of the closed path. As each platform arrives at the emptying station, the outlet of the corresponding receiving vessel is her-

metically connected to the inlet of the swingable pipeline, and thereafter the vessel is emptied through this pipeline while it swings during movement of the platform along the arcuate



portion of the path, the pipeline then being swung back to its initial position in preparation for emptying the vessel on the next platform.

3,699,924

HORSE STALL CONSTRUCTION

Richard A. Hero, Scottsdale, Ariz., assignor to Port-A-Stall

Filed Aug. 21, 1970, Ser. No. 65,936
Int. Cl. A01k *01/00*
U.S. Cl. 119—16 **8 Claims**

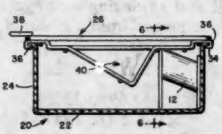
A kick-proof and chew-proof horse stall construction having wall panels, each comprising a plywood sheet having sheet metal contiguous with the inner and outer sides thereof; and a frame comprising removably bolted together members for holding said wall panels in an upright assembly to form a stall structure which may readily be disassembled and moved and reassembled.

3,699,925

COMBINATION CAGE AND FEEDER FOR RODENTS

Cornelis G. Van Dongen, Watertown, Mass., assignor to Bio-Research Consultants, Inc., Cambridge, Mass.

Filed June 4, 1971, Ser. No. 149,936
Int. Cl. A01k *01/00*
U.S. Cl. 119—18 **7 Claims**



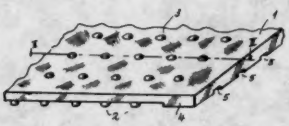
A cage comprising a receptacle having a floor, a circumscribing side wall and a removable cover, the latter, at least, containing openings and a feeder adapted to be disposed in the receptacle and held therein by engagement of the cover therewith comprising a plurality of spaced parallel chambers having open and closed ends, legs connecting the chambers and adapted to support the chambers from the floor of the cage in inclined positions with their open ends at the higher level, and members adapted to extend downwardly from the cover when the latter is applied to the top of the receptacle in confronting relation to the open ends of the chambers so as to prevent a rodent standing on the floor from raising itself into the open ends of the chambers.

3,699,926

FLOOR MAT FOR ANIMALS

Vilem Stockl, Amsterdam, Netherlands, assignor to Rubberindustrie Vasto N.V., Culemborg, Netherlands

Filed Oct. 19, 1970, Ser. No. 81,695
Int. Cl. A01j *1/00*
U.S. Cl. 119—28 **2 Claims**



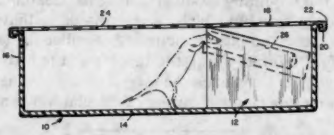
A rubber or plastic floor mat for a stable, factory or the like, the major surfaces of which are provided with regularly distributed projections with a substantially circular or polygonal cross-section, the projections of one surface lying intermediately between the projections of the other surface, at least a part of the peripheral zone of the mat being provided at the lower side with a thicker border portion extending substantially by the same distance as the lower projections. This border portion may be provided with transverse grooves extending over the full width of this portion.

3,699,927

FEEDER FOR RODENTS

Cornelis G. Van Dongen, Watertown, Mass., assignor to Bio-Research Consultants Inc., Cambridge, Mass.

Filed June 4, 1971, Ser. No. 149,927
Int. Cl. A01k *05/00*
U.S. Cl. 119—61 **8 Claims**



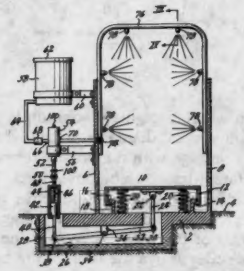
A cage comprising a container having a floor, a circumscribing side wall and optionally a removable top, the latter, at least, being of perforated construction, and a feeder disposed in the cage. The feeder comprises a member containing one or more chambers having open and closed ends for holding predetermined weights of food and is supported by legs from the floor of the cage with the chambers inclined and with the open ends at the higher level so that a rodent must stand on its hind legs to reach the open ends of the chambers.

3,699,928

CATTLE SPRAYING DEVICE

Frank O. Cowan, R.R. 1, Golden City, Mo.

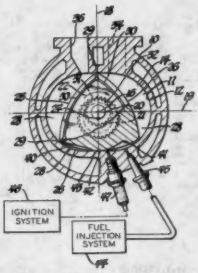
Filed July 14, 1971, Ser. No. 162,336
Int. Cl. A01k *29/00*; A61d *7/00, 11/00*
U.S. Cl. 119—159 **5 Claims**



A cattle spraying device comprising a chute through which cattle or the like may be driven, the floor of said chute con-

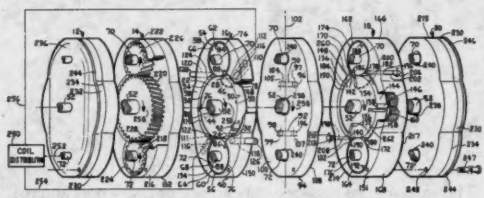
stituting a treadle depressible by the weight of said cattle, and a pump operable by the depression of said treadle to spray cattle passing through said chute with insecticide or other spray materials, said pump being specially adapted to deliver the spray liquid only when said treadle is depressed and for a limited time if the treadle remains depressed, and to deliver a uniform but adjustable quantity of spray for each depression of the treadle.

3,699,929
ROTARY COMBUSTION ENGINE
James E. Bennethum, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed May 19, 1971, Ser. No. 144,728
Int. Cl. F02b *53/10, 53/12*
U.S. Cl. 123—8.09 **6 Claims**



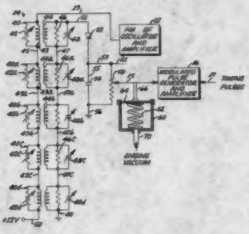
A rotary combustion engine having a piston whose contour provides each working chamber with a trailing region that is separated from a leading region by a flow restriction for initiating combustion wherein combustion is initiated by injecting and igniting fuel-air mixture in the trailing region whereafter the flow restriction is removed to permit flow from the trailing region to the leading region for continued combustion.

3,699,930
ROTARY INTERNAL COMBUSTION ENGINE
Earl G. Bunce, 414F Chateau Drive S.W., Huntsville, Ala.
Filed Nov. 8, 1971, Ser. No. 196,397
Int. Cl. F02b *53/08*
U.S. Cl. 123—8.41 **5 Claims**



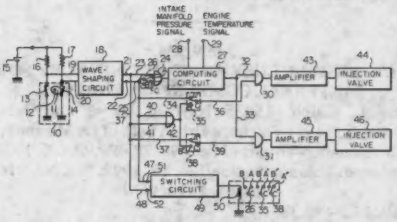
A rotary internal combustion engine having separately housed compression and power rotors and wherein there is a pair of sealing rotors positioned adjacent diametrically opposite peripheral edges of each rotor to form two sealed pressure chambers in each housing.

3,699,931
FUEL CONTROL SYSTEM USING RF CIRCUITS
Vincent J. Cinquegrani, 333 West Second Street, Scottsdale, Ariz.
Filed March 22, 1971, Ser. No. 126,694
Int. Cl. F02b *3/00;* **F02m** *39/00*
U.S. Cl. 123—32 EA **18 Claims**



Apparatus for controlling the injection of fuel in an internal combustion engine utilizes RF circuits including a tuneable RF detector responsive to the speed of the engine.

3,699,932
ELECTRONICALLY CONTROLLED FUEL INJECTION SYSTEM
Shigeo Aono, 3-68, Oppama-higashi-cho, and Nobuzi Manaka, 3-15-1, Morisaki, both of Yokosuka, Japan
Filed Oct. 22, 1970, Ser. No. 82,946
Claims priority, application Japan, Oct. 22, 1969, 44/84427
Int. Cl. F02b *3/00*
U.S. Cl. 123—32 EA **6 Claims**

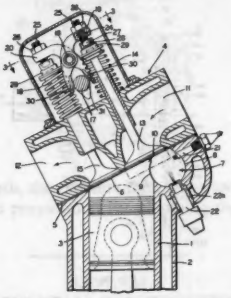


An electronically controlled fuel injection system which is so designed as to adapt itself to operation of high engine speed by effecting a switching from two-cylinder simultaneous injection to four-cylinder simultaneous injection. When the engine is operating at speeds below a predetermined value, a fuel injection pulse signal, which occurs at the rate of two pulses for each rotation of the engine shaft, is applied alternately to the injection valve associated with the first and third cylinders and the injection valve associated with the second and fourth cylinders, so that fuel injection takes place simultaneously in the first and third cylinders and it is followed by a simultaneous fuel injection in the second and fourth cylinders. On the other hand, when engine speed increases to the predetermined value, a switching is effected from the two-cylinder simultaneous injection to four-cylinder simultaneous injection. A switching from the four-cylinder simultaneous injection to two-cylinder simultaneous injection occurs when engine speed decreases to another predetermined value lower than said predetermined value.

3,699,933
VALVE OPERATING ARRANGEMENT FOR INTERNAL COMBUSTION RECIPROCATING ENGINES

Otis D. Treiber, 3080 Stanley Ave., Santa Cruz, Calif.

Division of Ser. No. 794,555, Jan. 28, 1969, Pat. No. 3,592,172. This application March 22, 1971, Ser. No. 126,841
Int. Cl. F011 *1/04, 1/18;* F02b *9/16*
U.S. Cl. 123—90.27 1 Claim

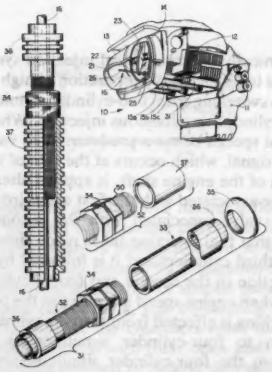


A valve operating arrangement for an internal combustion reciprocating engine having a combustion chamber shaped to permit the maximum feasible distance for travel of fuel spray from the spray nozzle tip, the spray nozzle being located so as to direct the fuel spray away from the combustion chamber walls clear of the piston and toward the cylinder head. The top of the piston and the top of the cylinder are at an angle to the axis of the cylinder, and the combustion chamber is on the long side of the cylinder. The exhaust and intake valves have their stems positioned normal to the combustion chamber, the engine camshaft being located between the exhaust and intake valve stems. Valve actuating rocker arms are partly rotatable on a rocker arm shaft located above and parallel to the camshaft. The rocker arms are equipped with shoes to contact the cams. The rocker arms have screw adjustable ball and socket slidable components with the valve stems, and there is a locking means for the adjustable screw.

3,699,934
EXTENSIBLE LUBRICANT-RETURN TUBE FOR INTERNAL COMBUSTION ENGINES

Eugene T. Gaipo, 15035 Rayfield Drive, and James E. Mattingly, 14911 Fairhope Drive, both of La Miranda, Calif.

Continuation-in-part of Ser. No. 78,489, Oct. 6, 1970, abandoned. This application Jan. 10, 1972, Ser. No. 216,451
Int. Cl. F01m *9/10*
U.S. Cl. 123—90.38 15 Claims

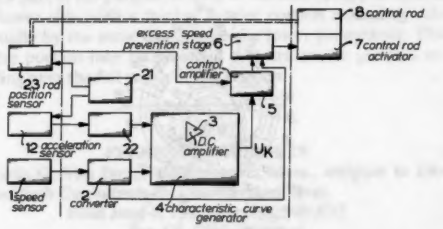


An extensible lubricant-return tube, for enclosing a pushrod in an internal combustion engine, having gaskets at the opposite ends of the tube and comprising an outer sleeve and an inner insert. The outer sleeve is internally smooth and the inner insert is externally threaded in the area where it telescopes into the sleeve. A pair of internally threaded locking torroids disposed on the inner insert serve to adjust and lock the sleeve and insert to the required length.

3,699,935
FAIL-SAFE FUEL INJECTION CONTROL ARRANGEMENT FOR INTERNAL COMBUSTION ENGINES

Karl-Heinz Adler, Leonberg; Johannes Locher, Stuttgart; Rudolf Lemanczyk, Stuttgart, and Edgar Schonart, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 11, 1970, Ser. No. 97,271
Claims priority, application Germany, Dec. 13, 1969, P 19 62 570.8
Int. Cl. F02d *11/10*
U.S. Cl. 123—102 34 Claims

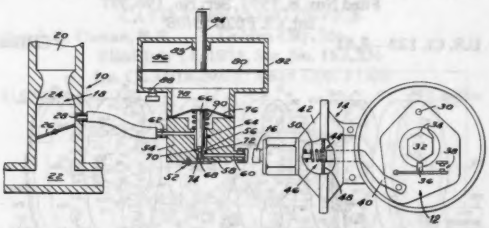


An electrically controlled control element determines fuel injection per operating cycle. The control circuit determining position of control element receives signals indicating gas pedal position, engine speed, and feedback signal indicating control element position. Each of these signals varies with corresponding parameter in such a manner that interruption of the signal causes minimum fuel injection. Additional limiting circuits within control system also designed to cause minimum fuel injection during circuit failure.

3,699,936
ACCELERATOR PUMP CONTROLLED ENGINE SPARK TIMING

Richard D. Vartanian, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 2, 1970, Ser. No. 94,361
Int. Cl. F02p *5/10*
U.S. Cl. 123—117 A 9 Claims



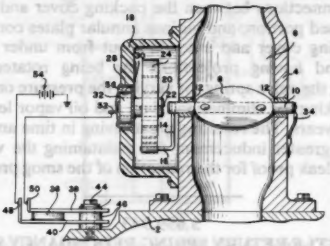
The vacuum line between the carburetor spark port and the engine distributor breaker plate servo actuator includes an air bleed valve that is normally closed to permit normal advance of the engine timing as a function of spark port vacuum changes, but is opened by a servo actuated directly by the carburetor accelerator pump linkage during vehicle accelerations to bleed air to the distributor servo to condition the timing for retarded operation.

3,699,937

SOLID STATE CONTROLLED AUTOMATIC CHOKE

Peter S. De Petris, 2004 La Salle Avenue, Niagara Falls, N.Y.

Filed Aug. 4, 1971, Ser. No. 169,002
Int. Cl. F02d *11/08*; F02m *1/10, 23/04*
U.S. Cl. 123—119 F 9 Claims



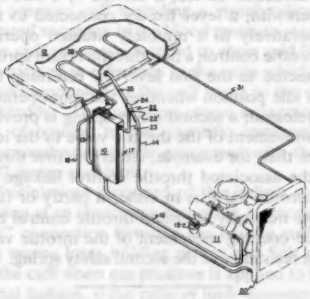
An electrical heating means for the bimetallic thermostatic spring controlling a carburetor automatic choke valve is in series with a negative temperature coefficient thermistor which senses engine and/or ambient air temperature to open the choke valve in a more efficient manner and thus reduce air pollution and improve engine performance during warm-up. The electrical heating means may be either a conventional resistance heater or a positive temperature coefficient thermistor.

3,699,938

GAS EXPANDER

Raymond R. Frazier, Route 4, Weiser, Idaho

Filed Jan. 25, 1971, Ser. No. 109,412
Int. Cl. F02m *31/00, 59/00*
U.S. Cl. 123—122 E 1 Claim



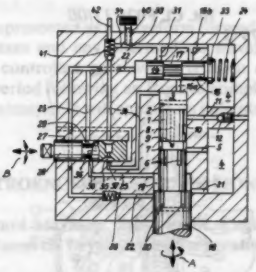
The gas expander assembly of this invention comprises a housing, a coil distally disposed in the housing in communication with a fuel supply tank and a combustion engine, and means interconnecting the housing to the engine cooling system being operable to receive heated liquid coolant materials from the engine to cause heating of fuel in the coil, and means operable to separate fuel vapors and the expanded fuel wherein fuel vapors are conducted back to the fuel supply system and expanded fuels are conducted to the engine.

3,699,939

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES AND METHOD OF FUEL CONTROL

Konrad Eckert, Stuttgart-Bad Cannstatt; Franz Eheim; Gerald Hofer, both of Stuttgart, and Claus Koster, Ditzingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed June 8, 1970, Ser. No. 44,017
Claims priority, application Germany, June 19, 1969, P 19 31 039.5
Int. Cl. F02d *1/04*
U.S. Cl. 123—140 J 10 Claims



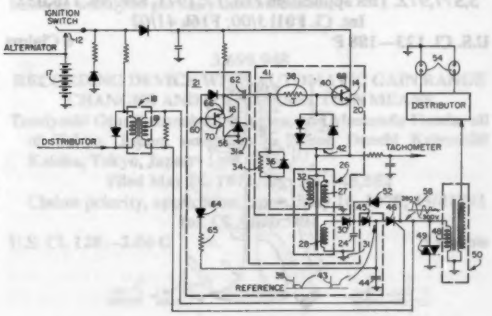
In a fuel injection pump, in order to prolong the duration of fuel injection during each pressure stroke of the pump piston in the idling or low load rpm range, there is provided a bypass channel extending from the pump work chamber for continuously discharging part of the fuel displaced by the pump piston. Said bypass channel contains a valve means which closes the bypass channel when the engine rpm exceeds the idling or low load rpm range.

3,699,940

INITIATION CIRCUIT FOR A CAPACITOR DISCHARGE IGNITION SYSTEM

Robert J. Vargas, Arlington Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed July 14, 1971, Ser. No. 162,580
Int. Cl. F02p *1/00*
U.S. Cl. 123—148 E 5 Claims



An initiation circuit for a capacitor discharge ignition system for an internal combustion engine having an ignition capacitor, a semiconductor trigger means for discharging the ignition capacitor in synchronism with the engine, an oscillator providing charging pulses for the ignition capacitor and an enabling circuit responsive to the operation of the semiconductor trigger to couple a signal to the oscillator to initiate the same with the enabling circuit including a transistor and zener diode coupled across the output of the transistor to a

reference potential to prevent changes in supply potential from initiating the oscillator. A high voltage output transformer coupled to the semiconductor trigger provides a discharge path for the ignition capacitor.

3,699,941

FUEL CONTROL APPARATUS

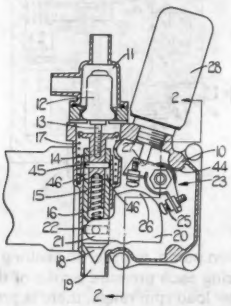
Ronald William Hughes, Birmingham, and Alan Boyse, Solihull, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Dec. 23, 1970, Ser. No. 100,860

Claims priority, application Great Britain, Jan. 6, 1970, 560/70

Int. Cl. F02n *17/00*

U.S. Cl. 123—179 G **10 Claims**



An apparatus for controlling a fuel injection system for an engine includes a cam rotatable in response to engine temperature and a cam follower selectively engageable with different portions of the cam. The output of the cam follower provides one input of an arrangement for varying the position of a control stop on a metering pump for the system, and the said selective engagement is operated during engine starting to provide an increased fuel supply.

3,699,942

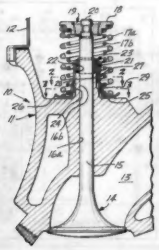
ADJUSTABLE VALVE STEM OIL SEALS FOR OLD AND NEW INTERNAL COMBUSTION ENGINES

Forest J. Moray, 1513 Books Avenue, Renton, Wash.

Continuation-in-part of Ser. No. 52,175, July 6, 1970, Pat. No. 3,577,972. This application Feb. 17, 1971, Ser. No. 116,032

Int. Cl. F01l *3/00*; F16k *41/02*

U.S. Cl. 123—188 P **6 Claims**



A new method and two seal mechanisms for carrying out the method are disclosed for preventing oil leaks around valve stems in internal combustion (I.C.) engines having a raised valve guide portion, for the elimination of the smog problem, carbon monoxide, engine sludge, and excess oil usage.

The basic method comprises placing a packing seal on the valve guide raised portion around the valve stem, forming a packing cover over the valve packing and raised portion, and positioning an annular plate under the valve spring and connected to the valve cover for adjusting the pressure on the valve packing without having to remove the valve spring for prevention of leaks from around the valve stem. Another method comprises varying the last step of the basic method as by forming various connections between the valve cover and valve guide raised portion. Two exemplary seal mechanisms are disclosed for carrying out the methods comprising a packing fitted on the seal guide raised portion of the I.C. engine head, a packing cover pressed over the packing, two different connections between the packing cover and the valve guide raised portion, and various annular plates connected to the packing cover and extending out from under the valve spring and having projections for being rotated without removing the valve spring for varying the pressure on the valve stem packing for elimination of oil and oil vapor leaks as the packing wears. The resulting great saving in time and expense provides greater inducement for maintaining the valve seals tight and leak proof for the reduction of the smog problem.

3,699,943

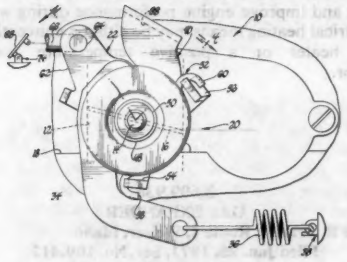
THROTTLE RETURN SPRING REDUNDANCY SYSTEM

Philip V. Eshelman, 19417 Greenwald Drive, Southfield, Mich.

Filed June 7, 1971, Ser. No. 150,670

Int. Cl. F02b *77/08*; F02d *11/04*; B60k *77/08*

U.S. Cl. 123—198 DB **7 Claims**



A throttle valve, situated within the induction passage of a fuel or air induction device, is carried by a throttle shaft for rotation therewith; a lever fixedly connected to the throttle shaft is operatively to a remotely situated operator's foot-operated throttle control; a first throttle return spring is operatively connected to the first lever for returning the throttle valve to an idle position whenever the foot-operated throttle control is released; a second safety spring is provided for assuring the movement of the throttle valve to the idle position in the event that, for example, either the first throttle return spring or the associated throttle control linkage should fail while the throttle valve is in either a partly or fully opened position; the manually operated throttle control being effective to force opening movement of the throttle valve against the resilient resistance of the second safety spring.

3,699,944

ANTI-SIPHON AND VENT MEANS FOR USE WITH AN OPEN-TO-ATMOSPHERE HOT WATER SUPPLY TANK

Harvey R. Karlen, Chicago, Ill., assignor to Cory Corporation

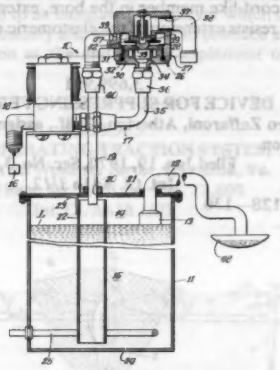
Filed Feb. 10, 1971, Ser. No. 114,147

Int. Cl. A47g *23/04*

U.S. Cl. 126—362 **9 Claims**

An anti-siphon and vent means for use with an open-to-atmosphere hot water supply tank. The anti-siphon and vent means is mounted downstream of a shutoff valve for controlling flow conditions relative to the hot water heating tank. The anti-siphon and vent means is arranged to permit free

flow of cold water to the tank when the shutoff valve is open and to vent the tank to atmosphere and prevent backflow of



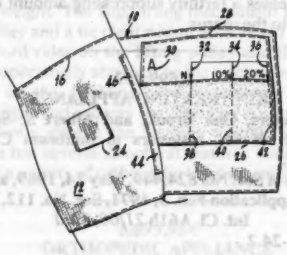
water from the tank to the shutoff valve in the event of a failure of pressure in the cold water supply through the valve.

3,699,945

BLOOD PRESSURE CUFF WITH CALIBRATED HOLDING MEANS

Paul M. Hanafin, 240 Readington Road, Somerville, N.J.

Filed July 30, 1970, Ser. No. 59,620
Int. Cl. A61b 5/02
U.S. Cl. 128—2.05 C **10 Claims**



A blood pressure cuff including a visual indication of the limit of assured accuracy in the blood pressure recording. The point of the cuff closure is marked to show said limit, the indicia being located in reference to the ratio which the diameter of the limb encircled by the cuff bears to the width of the occluding bladder. The markings assure acceptance (despite differences of opinion in the scientific community) by the major recognized associations concerned with the establishment of cuff design standards.

The cuff minimizes disregard of the indicia and the consequent taking of an inaccurate recording, by incorporation of a "fail-safe" connection between the mating cuff ends. The connecting means loses holding power and fails to maintain closure of the cuff when gas pressure is applied to the bladder in the normal fashion, if the ratio of limb diameter to bladder width exceeds known standards.

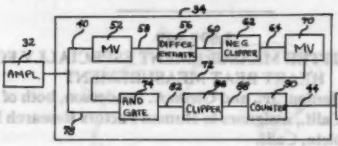
3,699,946

WAVEFORM ABNORMALITY MONITOR

Walter A. Michel, 9035 North Mango Avenue, Morton Grove, Ill.

Filed Aug. 11, 1970, Ser. No. 62,831
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 A **8 Claims**

A portable, programmable electronic device for monitoring the heartbeat waveform of an ambulatory individual by sensing the difference between potentials from a pair of sensors attached to the individual, and electronically processing the waveform to detect and warn of the presence in that waveform of abnormalities, such as extrasystoles, which indicate the imminence of a possible heart attack. The potential



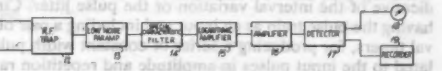
difference, represented as a waveform formed by a series of R-wave complexes and any intermediate waveforms, is passed into a time controlled gate which is open during only the monitoring period following an R-wave complex so that an intermediate extrasystole will actuate an indicator.

3,699,947

ELECTROENCEPHALOGRAPH MONITORING APPARATUS

Douglas Edward Maynard, Stoke Poges, England, assignor to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 771,192, Oct. 28, 1968, abandoned. This application July 13, 1971, Ser. No. 162,165
Int. Cl. A61b 5/04
U.S. Cl. 128—2.1 B **16 Claims**



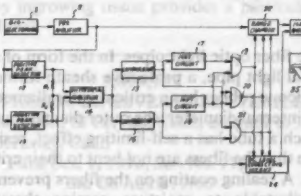
Monitoring equipment is provided for monitoring electrical signals in the human brain. Signals from electrodes attached to the scalp are passed to a bandpass filter where certain interference signals, such as those arising from muscle action and rapid psycho-galvanic responses, are removed. The filter also applies a weighting to equalize the effect of random brain activity over the filter band, and to allow rhythmic activity to be more clearly observed. A logarithmic amplifier is connected to the filter output to provide amplitude compression signals received from the brain. The impedance between the electrodes is monitored to give an indication if the electrodes become wholly or partially disconnected.

3,699,948

RECORDING DEVICE WITH AUTOMATIC GAIN RANGE CHANGER AND D.C. CORRECTION MEANS

Tomiyoshi Ota; Katunobu Takigawa, and Masasada Honda, all of Tokyo, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1971, Ser. No. 143,552
Claims priority, application Japan, May 16, 1970, 45/41741
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 G **5 Claims**



An automatic recording device incorporating a range changer and an asymmetrical DC level correcting means. The

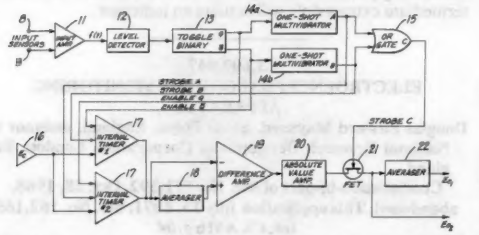
range changer automatically selects a gain capable of supplying the recorder, for example, with an electrocardiograph signal of suitable amplitude regardless of the amplitude of the detected electrocardiograph signal. The asymmetrical DC level correcting means corrects the DC level of the recorder so as to center the electrocardiogram on the recording chart.

3,699,949

PULSE JITTER MEASUREMENT ESPECIALLY FOR HEART BEAT MEASUREMENT

James F. O'Hanlon, Jr., and Glenn A. Sanderson, both of Santa Barbara, Calif., assignors to Human Factors Research Incorporated, Goleta, Calif.

Filed July 26, 1971, Ser. No. 165,947
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 A **8 Claims**



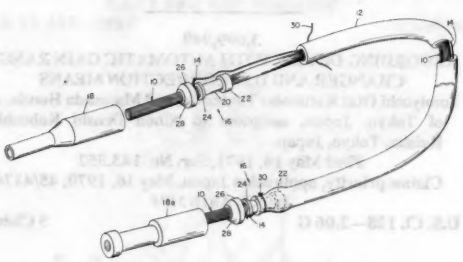
Apparatus for measuring the difference in intervals between pulses of a pulse train and providing a continuous output indicative of the interval variation or the pulse jitter. Circuitry having the pulse train as an input and including a pair of interval timers, for producing a series of constant width pulses related to the input pulses in amplitude and repetition rate. An averager and a difference amplifier for providing an output which is a function of the difference between each pulse interval and the average pulse interval.

3,699,950

FLEXIBLE OPTICAL LIGHT PIPES USED FOR SURGERY

William G. Humphrey, Jr., and Michael L. Rishton, both of Reading, Mass., assignors to Dyonics Inc., Woburn, Mass.

Filed July 2, 1970, Ser. No. 51,883
Int. Cl. A61b 1/06; F16l 13/00, 33/00
U.S. Cl. 128—23 **15 Claims**



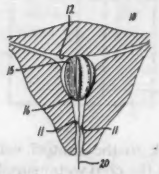
Flexible fiber optic light pipes. In the form of an autoclavable surgical light pipe, a protective sheath formed by a single tube of silicone rubber has a critical outer diameter at least 2¼ times the internal diameter, the outer diameter on the order of 8 mm. Such a tube has a self-limiting effect, resisting bending of itself so that the fibers are not bent to their critical angle for breakage. A sealing coating on the fibers prevents adverse effects attributable to moisture passing through the wall thickness of the tube while end sealing prevents wash-off of the coating. An end sealing arrangement is shown with end cap and ferrule gripping the thickness of the tube, forming a gasket seal. Correspondingly tapered, butted and bonded surfaces align the assembly and provide a uniform seal. An inextensible cord-like member in the bore, extending between the ferrules, resists extension of the elastomeric outer tube.

3,699,951

DEVICE FOR SUPPRESSING FERTILITY

Alejandro Zaffaroni, Atherton, Calif., assignor to ALZA Corporation

Filed Jan. 19, 1970, Ser. No. 3,852
Int. Cl. A41b 3/12
U.S. Cl. 128—130 **4 Claims**



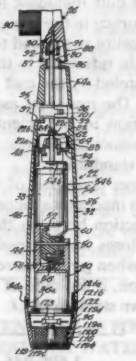
Fertility suppression in a female mammal is achieved with a device for insertion and retention in the uterus in the form of a flexible, resilient body of polymeric material having an elastic memory. The body has an ellipsoidal shape and a fluted surface. When inserted into the uterine cavity in a compacted state, the body assumes an ellipsoidal configuration. Preferably, the device contains an anti-fertility agent, most preferably progesterone, and is permeable to passage of the anti-fertility agent at a low rate. Upon insertion in the uterus, the device releases a fertility suppressing amount of the anti-fertility agent to the uterus.

3,699,952

SKIN TREATING APPLIANCE

Robert S. Waters, Oak Brook, and Albert S. Spohr, Park Ridge, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Continuation of Ser. No. 824,449, May 14, 1969, abandoned.
This application Feb. 3, 1971, Ser. No. 112,371
Int. Cl. A61b 21/00, 7/00
U.S. Cl. 128—24.2 **35 Claims**



An electrically operated appliance for treating skin utilizing an orbitally driven brush, massaging or skin conditioning instrument. The appliance is operated by means of a switch which is energized upon engagement of the brush or implement against the skin of the user. Control means are provided to immobilize the implement supporting shaft and prevent actuation of the operating switch when the brush or massage in-

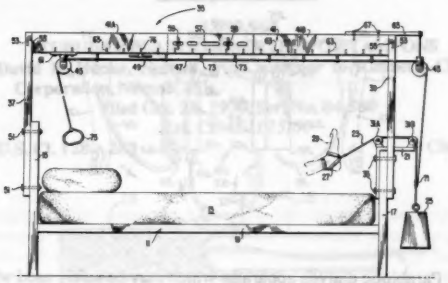
strument is attached or removed from the implement supporting shaft. The sealed housing of the appliance encloses a battery operated mechanism having a motor at one end of the enclosure connected to an elongated drive lever which straddles the rechargeable battery and is arranged to produce an elliptical, orbital motion at the end of the implement mounting shaft.

3,699,953

SELF-OPERATING TRACTION SYSTEM

Virginia S. Mason, 42 Westover Street, Hampton, Va.

Filed Sept. 16, 1970, Ser. No. 72,608
Int. Cl. A61h *1/02*
U.S. Cl. 128—75 **7 Claims**



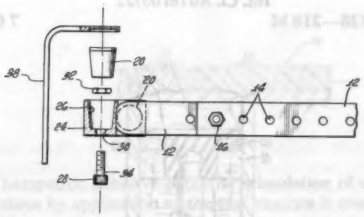
A self-operating traction system is disclosed. The system includes a supporting mechanism which is positioned above an orthopedic traction apparatus to support a lifting pulley above a traction weight. The supporting mechanism also supports a control pulley and a tie cleat within arms reach of a patient. A disabling cord rides on the lifting pulley and the control pulley, and is operatively attached to the traction weight. The patient pulls on the disabling cord to temporarily disable the traction weight and secures the disabling cord to the tie cleat to permanently disable the traction weight. The supporting mechanism has several structural features which permit it to be used for a variety of orthopedic traction applications.

3,699,954

ORTHOPEDIC APPLIANCE

William A. Craig, P.O. Box 81, Angwin, Calif.

Filed Aug. 25, 1971, Ser. No. 174,620
Int. Cl. A61f *3/00*
U.S. Cl. 128—80 A **2 Claims**



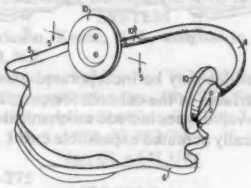
An improved orthopedic appliance having an adjustable length and provided with tapered sockets for cone locks for receiving cone members attached to anchor bars and rotatable in various positions to provide proper positioning of a patient's legs and hips so that orthopedic defects may be corrected.

3,699,955

HEADBAND DEVICE FOR SINUS RELIEF

Neill McK. Heath, 1808 Goodwin Street, Jacksonville, Fla.

Filed Dec. 31, 1970, Ser. No. 103,190
Int. Cl. A61f *5/24*
U.S. Cl. 128—97 **14 Claims**



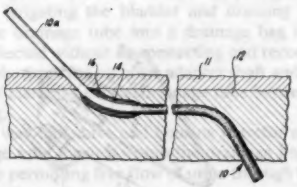
The headband device for use by persons having difficulty in breathing due to sinus trouble, head colds, or deflected septums, includes a pair of disk members adapted to contact the alae nasal region of the person's face at opposite sides of the person's nose. A flexible cross-piece of general arcuate shape has its ends respectively connected at a fixed angle to the disk members and is adapted to be disposed across the face of the person opposite his mouth. Elastic straps extend from the respective disk members to the back of the person's head, with provision for securing the outer ends of the straps together, whereby when the elastic straps are tightened the pressure on the alae nasal passages at each side of the nose is increased due to the angular connection of the cross-piece to the disk members, thereby pulling the alae on opposite sides of the nose away from the nose to maintain the nasal passages unobstructed.

3,699,956

PERCUTANEOUS LEAD DEVICE

Sotiris Kitrilakis, Berkeley, and Thomas C. Robinson, El Cerrito, both of Calif., assignors to Tecna Corporation, Berkeley, Calif.

Filed Oct. 1, 1970, Ser. No. 77,290
Int. Cl. A61m *25/00*
U.S. Cl. 128—348 **9 Claims**



A percutaneous lead device including an element for preventing bacterial infection caused by implanting the lead through the skin. This element extends below and along the skin surface and includes an antibacterial fluid reservoir coated with a diffusion-controlling layer which maintains the desired fluid release rate. A surface configuration on the reservoir and lead which is highly adherent to and completely permeated by ingrowing tissue provides a particularly effective bacterial seal.

3,699,957

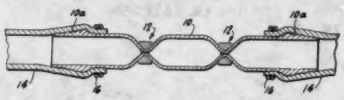
VAS PROSTHESIS FOR REVERSIBLE STERILIZATION

Thomas C. Robinson, El Cerrito, Calif., assignor to Tecna Corporation, Berkeley, Calif.

Filed Oct. 1, 1970, Ser. No. 77,201
Int. Cl. A61b *19/00*
U.S. Cl. 128—1 R **6 Claims**

A prosthetic device for reversibly blocking semen flow through the vas deferens including a cannula for sealed

coupling with severed portions of the vas and a reversible valve associated with the cannula having a closed position for blocking fluid flow and an open position for permitting fluid

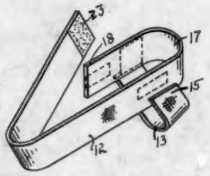


flow. Microcavities may be incorporated externally or internally on the surfaces of the cannula for compatibility with living tissue. The valve types include mechanical clamps or plugs and a hydraulically actuated expandible cuff.

3,699,958
ANTIMICROBIAL WOVEN OR KNITTED FABRIC
Laszlo G. Szucs, Ackermannstr. 6, Zurich, Switzerland
Filed Dec. 31, 1970, Ser. No. 103,145
Int. Cl. A62b *23/06*
U.S. Cl. 128—146.2 **19 Claims**

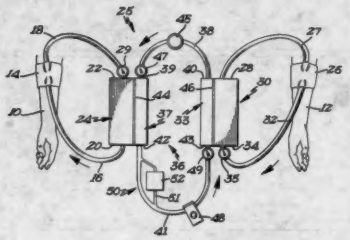
An antimicrobial woven or knitted fabric which is made from crimp yarn and treated with cation-active antimicrobial compounds and the use of said fabric as surgical dressing or surgical face mask.

3,699,959
BANDAGE CONSTRUCTION
William F. Garrahan; Edwin J. Madden, both of 166 Tollgate Road, and Clarence J. Picard, 981 Greenwich Avenue, all of Warwick, R.I.
Filed Dec. 16, 1970, Ser. No. 98,747
Int. Cl. A61f *13/06*
U.S. Cl. 128—166 **4 Claims**



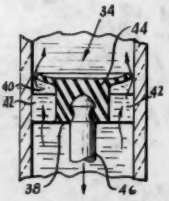
An elastic bandage construction for traumatic and post traumatic bandages for supporting after sprains, broken bones after the removal of the cast, for minor fractures and chronically unstable joints and ligaments. The bandage is made of an elastic material preferably with a soft nap to cut down on chafing and make the bandage more comfortable. The bandage has a performed section to fit around an ankle. It is then provided with an elongated integral section for wrapping around the joint. "Velcro" fasteners are provided not only at the end of the bandage but intermediately so that after a proper and comfortable tightening of the bandage, it will be retained in place while the hands are free to complete the bandaging operation. The bandage is constructed to provide for support without bulk. The user can tighten or adjust the bandage as desired. The bandage comprises an elongated portion having one end turned into a U-shape to fit around the back of the foot and around the Achilles tendon. A second looped portion is sewed to the bottom edge of the U-shaped portion and is adapted to extend around the bottom of the arch or instep. These portions are then tightened around the foot and locked in place by a suitably positioned "Velcro" fastener. The elongated section can then be wrapped around the instep and then completely around the ankle and finished off with another "Velcro" fastener.

3,699,960
PARABIOTIC DIALYSIS APPARATUS
Frank B. Freedman, 3430 Boone Avenue S., Minneapolis, Minn.
Filed Jan. 4, 1971, Ser. No. 103,774
Int. Cl. A61m *01/03, 05/00*
U.S. Cl. 128—214 B **11 Claims**



Parabiotic dialysis apparatus which may be safely used with humans is disclosed. Three chambers are fluidically interconnected yet separated by two membranes to enable safe and efficient transfer of substances between the blood of two organisms. One chamber is arranged to be connected into the blood circulation system of a normal human. A second chamber is arranged to be connected into the blood circulation system of a diseased human. A third chamber, which is split into two interconnected halves, is arranged to hold physiological fluid. The chambers are arranged with the third chamber between the first and second chambers. The membranes are arranged with one membrane forming the fluid boundary between the first chamber and one half of the third chamber and the second membrane forming the fluid boundary between the second chamber and the other half of the third chamber to thus provide a fluid path from the first chamber to the second chamber which fluid path can transfer substances to and from the first and second chambers across the membranes and third chamber due to convection and diffusion.

3,699,961
SYRINGE AND METHOD
Roman Szpur, Dayton, Ohio, assignor to The Sebon Corporation, Dayton, Ohio
Filed March 12, 1970, Ser. No. 18,925
Int. Cl. A61m *05/22*
U.S. Cl. 128—218 M **7 Claims**



A syringe assembly utilizes a one way valve which comprises a compliant plate portion adapted to partition a syringe barrel. The compliant plate portion moves in response to pressures developed within the syringe barrel and the valve includes a brace portion which limits compliance of the plate portion to

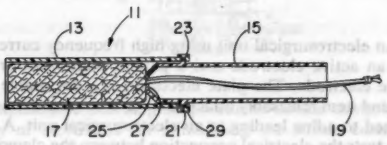
pressures exerted in a given direction. Due to compliance by the plate portion, fluid can flow within the syringe barrel and around the plate portion when the pressure acting on the fluid is in the opposite direction but, by reason of the compliant plate being braced, cannot flow through the valve when a pressure is developed in said given direction. Two embodiments of the valve are disclosed. Three methods of assembly are disclosed; one wherein a medicine is confined within the syringe assembly under a positive pressure, another wherein the medicine is confined under atmospheric pressure, and a third wherein two components of medicine are confined in separate syringe compartments. A preferred mode of syringe activation is disclosed wherein a traveling seal closing one end of the syringe is caused to cling to the syringe valve so as to maintain the syringe in readiness for aspiration.

3,699,962

TUBULAR PLASTIC INSERTER FOR TAMPONS

David E. Hanke, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 28, 1970, Ser. No. 84,580
Int. Cl. A61f *15/00*
U.S. Cl. 128—263 **9 Claims**



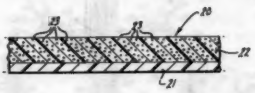
A plastic inserter for tampons consisting of inner and outer telescoping tubular members which are releasably interlocked against axial movement in both directions by mating configurations on the inner wall of the outer tube and the outer wall of the inner tube. One of the tubular members, preferably the outer member is made of a firm plastic, while the other member, is made of softer, less rigid plastic which more readily undergoes elastic deformation than the firm plastic whereby smooth disengagement of the interlocked tubes results when axial force is applied to the trailing end of the inner tube member by the user in order to release the interlock and eject the contents of the outer tube member.

3,699,963

THERAPEUTIC ADHESIVE PATCH

Alejandro Zaffaroni, Atherton, Calif., assignor to ALZA Corporation

Filed Oct. 31, 1969, Ser. No. 872,862
Int. Cl. A61f *7/02*
U.S. Cl. 128—268 **12 Claims**



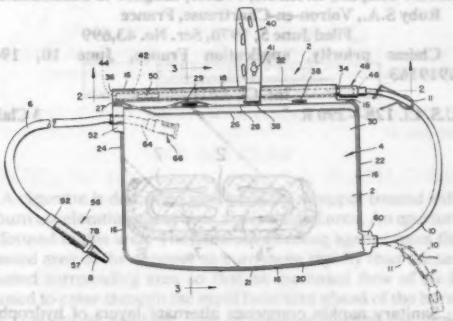
Therapeutic adhesive patch for stimulation of uterine contractions by application to the oral mucosa is comprised of a backing member, an amount of an oxytocic drug sufficient to release a therapeutically effective amount of the drug to the oral mucosa, and a pressure-sensitive adhesive coating. The oxytocic drug can be dispersed through or coated on the pressure-sensitive adhesive; can be microencapsulated with a material permeable to passage of the drug and the microcapsules distributed throughout the pressure-sensitive adhesive; or can be incorporated in a reservoir layer permeable to passage of the drug and mounted on or laminated to the backing member and bearing a coating of the pressure-sensitive adhesive. The pressure-sensitive adhesive coating can cover the full-face surface of the adhesive patch or a part thereof, such as the perimeter of the face surface of the patch.

3,699,964

CLOSED URINARY DRAINAGE AND IRRIGATION SYSTEM

Richard E. Ericson, Keene, N.H., assignor to C.R. Bard Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 793,403, Jan. 23, 1969, abandoned. This application Dec. 28, 1970, Ser. No. 101,976
Claims priority, application Canada, July 2, 1970, 087040; Great Britain, July 3, 1970, 32,372/70
Int. Cl. A61f *5/44*
U.S. Cl. 128—275 **41 Claims**



A closed system, disposable, urinary drainage and irrigation system having the following improvements:

1. a flexible drainage tube of increased internal diameter, which is larger than the maximum internal diameter at which a continuous column of urine will form in the tube when urine flows therethrough by gravity from the bladder, to thereby prevent microorganisms from ascending the tube to the bladder;

2. a circumferential slit extending part way around the circumference of the drainage tube located over the shank of the catheter adapter to provide a unique type irrigation valve for alternately irrigating the bladder and draining the bladder through the drainage tube into a drainage bag in which the urine is collected without disconnecting and reconnecting the drainage tube from the catheter adapter shaft and without the necessity of clamping off the drainage tube between the valve and the bag;

3. a one way ball valve and housing therefor at the end of the drainage tube located within the drainage bag to prevent reflux while permitting free flow of urine through the drainage tube into the bag;

4. a protective cap over the end of the draw off tube for drawing urine from the drainage bag, such cap being effective to protect the end of the draw off tube from contact with contaminated objects; and

5. a disposable, plastic syringe in which the sterile irrigating fluid is prepackaged and which is particularly adapted to be used with the aforesaid irrigation valve to permit irrigation without leakage.

3,699,965

TAMPON FOR ABSORBING BODY FLUIDS

Zdenek Denny Dostal, Ramsey, N.J., assignor to International Playtex Corporation, New York, N.Y.

Filed Nov. 10, 1970, Ser. No. 88,434
Int. Cl. A61f *13/20*
U.S. Cl. 128—285 **12 Claims**

An article of manufacture for the absorption of body fluids, particularly tampons, comprising a body portion with at least a portion of the filaments which make up the body portion being

inflated filaments having voids therein. The inflated filaments have a lower specific gravity than like non-inflated filaments, and are preferably of cellulose base materials, and as used in a

tampon provide a product having the ability, upon the application of moisture to increase in size in both length and diameter.

3,699,966

SANITARY NAPKIN

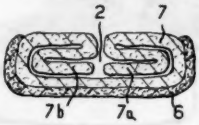
Robert Chapuis, Grenoble, France, assignor to Etablissements Ruby S.A., Voiron-en-Chartreuse, France

Filed June 5, 1970, Ser. No. 43,699

Claims priority, application France, June 10, 1969, 6919163

Int. Cl. A61f 13/16

U.S. Cl. 128—290 R **3 Claims**



Sanitary napkin comprises alternate layers of hydrophilic and hydrophobic material, with the edges of the hydrophilic material folded inward to define a channel extending through the middle of one side of the napkin.

3,699,967

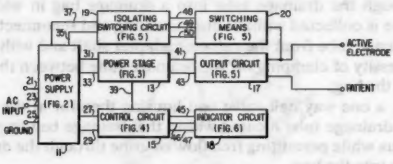
ELECTROSURGICAL GENERATOR

Robert K. Anderson, Boulder, Colo., assignor to Valleylab, Inc., Boulder, Colo.

Filed April 30, 1971, Ser. No. 139,085

Int. Cl. A61b 17/36

U.S. Cl. 128—303.14 **24 Claims**



An isolated output electrosurgical generator suitable for generating cutting and coagulation electrosurgical currents is described. The electrosurgical generator using a single power stage generates three distinct and independent currents—a coagulation current for hemostasis or tissue destruction; a pure cutting current for cutting with a minimum amount of hemostasis; and a blended cutting current with a moderate amount of hemostasis. The electrosurgical generator includes a solid state power stage driven by two discrete frequencies that provide substantially differing cutting and coagulation characteristics. The electrosurgical generator also includes a solid state control circuit that controls the operation of the power stage. More specifically, the control circuit controls whether the power stage generates a current near the resonant frequency of the LC circuit so that a coagulation current or a blended cutting current is generated or whether the power stage generates a current at another frequency whereby a pure cutting current is generated. The output from the power stage is connected through an output circuit to suitable electrosurgical instrument terminals. An indicator circuit is used to provide audio and visual indication of activation of the electrosurgical generator. In addition, the electrosurgical generator provides electrical isolation on all output connections to prevent patient burns caused by alternate return current paths.

3,699,968

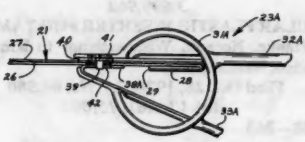
ELECTRICAL CONNECTOR AND PLATE ELECTRODE

Lee R. Bolduc, Minneapolis, Minn., assignor to Medical Plastics, Inc., Minneapolis, Minn.

Division of Ser. No. 762,582, Sept. 25, 1968, Pat. No. 3,624,590. This application May 20, 1971, Ser. No. 145,164

Int. Cl. A61b 17/36

U.S. Cl. 128—303.13 **17 Claims**



An electrosurgical unit using high frequency currents having an active electrode and a patient indifferent or ground plate electrode. The plate electrode is a disposable flexible ground item releasably attached to an electrical connector attached to a line leading to an electrosurgical unit. A test circuit tests the electrical connection between the clamp and the plate. The releasable connector has a flat contact plate in surface engagement with the ground electrode and at least one projection or edge coacting with the ground plate electrode to prevent accidental separation of the connector from the electrode. One form of the connector has a pair of plate contacts attached to and pivotally mounted on flat electrically conductive covers.

3,699,969

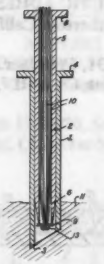
METHOD FOR IMPLANTING NATURAL OR SYNTHETIC FIBERS INTO LIVING TISSUE

William Glenn Allen, 2329 Tuscora Road, Bon Air, Va.

Filed June 1, 1971, Ser. No. 148,308

Int. Cl. A61b 17/00, 17/34; A61f 1/00

U.S. Cl. 128—330 **4 Claims**



A method for implanting natural or synthetic fibers directly into the skin, particularly the scalp. The method is effected by the use of a concentric dual needle arrangement that comprises a first, outer needle and a second, inner needle slideably mounted within the outer needle. The fibrous material to be implanted is threaded within the inner needle, the latter then being "loaded" or mounted within the bore of the outer needle. The two needles are then inserted simultaneously into the scalp. The outer needle is withdrawn first to expose the fibrous strands to the tissue. The inner needle is next withdrawn leaving the fibrous strands implanted in the tissue. The method is highly effective, safe and requires a minimum of manipulative steps.

3,699,970

STRIATE CORTEX STIMULATOR

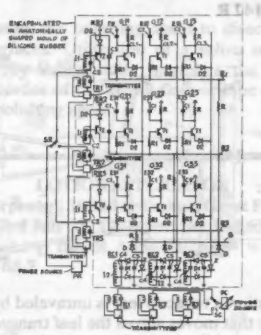
Giles Skey Brindley, London, and Peter Eden Kirwan Donaldson, Oxford, both of England, assignors to National Research Development Corporation, London, England

Filed June 23, 1970, Ser. No. 49,094

Claims priority, application Great Britain, June 26, 1969, 32,398/69

Int. Cl. A61n *1/18*

U.S. Cl. 128—419 R 8 Claims



An implantable neurological prosthetic device comprises a plurality of electrodes for stimulating the striate cortex, a matrix of normally closed gates connected in one-to-one relationship with said electrodes, and a plurality of radio receivers tuned to predetermined frequencies and constituting at least two distinctive sets, each gate being connected for switching to an open state to energize the respective one of said electrodes by a unique group of at least two of said receivers from respectively different sets thereof. The receivers are themselves energizable by externally located respective transmitters conveniently positioned by a technique in which the transmitter tuned circuit is included as one arm in a bridge circuit balanced for maximum absorption by the respective receiver tuned circuit. This technique is more generally applicable to any implant provided with a tuned circuit.

3,699,971

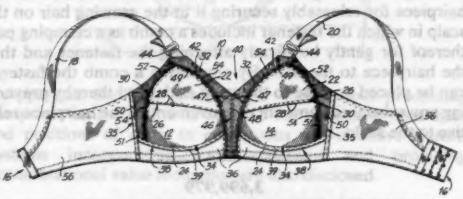
FOUNDATION GARMENT

William C. Hittel, New Hyde Park, N.Y., and Charles M. Sachs, Teaneck, N.J., assignors to International Playtex Corporation, New York, N.Y.

Filed Sept. 21, 1970, Ser. No. 73,824

Int. Cl. A41c *3/00*

U.S. Cl. 128—491 31 Claims



A brassiere providing both support and self-adjustment within standardized size designations having a torso encircling portion and non-stretchable bust cups having an underlying under-bust section and peripheral stretchable portions along the inner and outer edges of the cups. The stretchable portions along the inner edges of the cups form a medial Y section with the yoke of the Y between the cups. The stretch characteristics in the stretchable portions are preselected as to direction and degree to allow for self-adjustment in preselected areas and the transmittal of forces to dissipate their effect. The disclosure includes these features in front and rear closure embodiments in both bandeau and long-line versions.

3,699,972

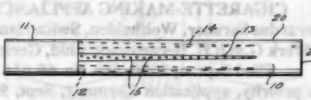
CIGARETTE

Andrew Ferdinand Frisch, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Aug. 31, 1970, Ser. No. 68,163

Int. Cl. A24d *01/02*

U.S. Cl. 131—9 11 Claims



A cigarette is described which has the wrapper treated with a burn accelerating agent over a preselected area. An aperture is formed in this area. The burn accelerating agent causes the treated area of the wrapper to burn more rapidly than the untreated surrounding area so that an increased flow of air is caused to enter through the rapid burn area ahead of the burning coal during smoking. The air entering through the rapid burn area, in combination with the air entering through the aperture, dilutes the smoke stream and substantially reduces the delivery of smoke constituents. The provision of a slit through the treated area provides for a constant flow of air through the wrapper, during puffing of the cigarette, thus causing some dilution of the smoke stream at all times.

3,699,973

FILM COVERING FOR APERTURED SMOKING PRODUCT WRAPPER

Ronald A. Tamol, and Leo F. Meyer, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed July 6, 1971, Ser. No. 160,083

Int. Cl. A24d *1/02*; D21h *5/16*

U.S. Cl. 131—15 B 6 Claims

The disclosure relates to a film covering for a smoking product wrapper, such as a cigarette wrapper. The wrapper is either porous, or is deliberately perforated with vents or apertures. These openings or vents are covered with a polymeric film that has been submitted to a degradation operation. The degradation is electrically produced, for example, by irradiation. The degradation expedites the removal of film over the apertures by smoke components so that air is permitted to dilute the smoke during the later stages of smoking.

3,699,974

CIGARETTE MANUFACTURE

Gordon Francis Wellington Powell, and Edward George Preston, both of London, England, assignors to Molins Machine Company Limited, Deptford, London, England

Filed June 25, 1970, Ser. No. 49,733

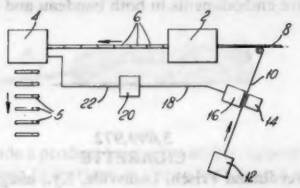
Claims priority, application Great Britain, June 27, 1969, 32,626/69

Int. Cl. A24c *5/34*

U.S. Cl. 131—21 R 15 Claims

A cigarette making system for making mouthpiece cigarettes ejects cigarettes which have web joins by utilizing

the facility of the assembler unit to eject incomplete assemblies, the assembly of a mouthpiece in each cigarette including



a web join being automatically stopped so that the incomplete assembly thus formed is ejected by the assembler unit.

3,699,975

CIGARETTE-MAKING APPLIANCE

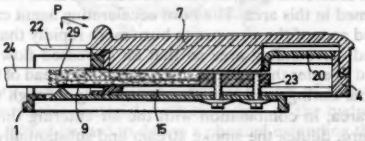
Petrus Gerardus Saraber, Wolfhalden, Switzerland, assignor to Gizeh-Werk G.m.b.H, Berneustadt/Rhld, Germany

Filed Sept. 4, 1970, Ser. No. 69,616

Claims priority, application Germany, Sept. 9, 1969, P 19 45 498.9

Int. Cl. A24c *05/42*

U.S. Cl. 131—70 **5 Claims**



A manually operable device for making cigarettes in which a chamber is formed between a stationary part of the device and a sliding part. The sliding part has a nozzle in or on it. Over the nozzle a pre-formed tube of cigarette paper can be clamped. The tobacco in the chamber is compressed to form a plug and the sliding part slid so as to reduce the chamber size thereby forcing the plug through the nozzle and into the tube of paper to form a cigarette.

3,699,976

METHOD FOR KILLING TOBACCO LEAF BUG INHABITANTS AND THEIR EGGS

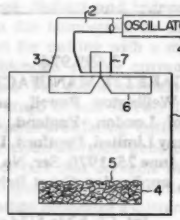
Isao Abe, Tokyo; Tatsuo Hirose, and Kotaro Ohshima, both of Yokohama-shi, all of Japan, assignors to The Japan Monopoly Corporation, Tokyo and Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Jan. 27, 1970, Ser. No. 6,144

Claims priority, application Japan, Jan. 27, 1969, 44/5430

Int. Cl. H05b *9/06*; A24b *3/00*, *9/00*

U.S. Cl. 131—121 **2 Claims**



Method and apparatus for upgrading by heat treatment vegetable matter such as the foliage of tobacco or tea, using high frequency electromagnetic waves of 900 MHz min. and additionally irradiating infrared rays during said heat treatment to elevate operating efficiency.

3,699,977

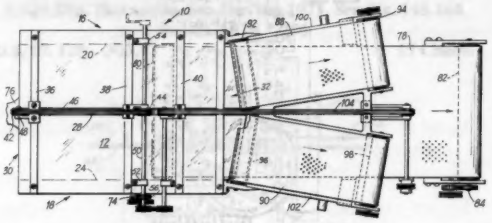
TOBACCO LEAF CONDITIONER

Frank Hollenton, Richmond, Va., assignor to AMF Incorporated

Filed Oct. 1, 1970, Ser. No. 77,135

Int. Cl. A24b *5/14*

U.S. Cl. 131—147 R **7 Claims**



In this invention a tobacco leaf is unraveled by subjecting it to a flow of air that moves across the leaf transversely from its stem to its edges while the leaf is constrained along its stem. There is also provided a first air permeable belt and two divergent air permeable belts which cooperate with suction chambers to flatten and stretch the leaf. Selective control is obtained when manipulating the suction values and speed differential of the belts.

3,699,978

WIG

James A. Holly, Richton Park, Ill., assignor to Permalok International, Inc.

Continuation-in-part of Ser. No. 65,945, Aug. 21, 1970, abandoned. This application Sept. 9, 1971, Ser. No. 178,859

Int. Cl. A41g *3/00*

U.S. Cl. 132—53 **8 Claims**

A wig comprising a hairpiece and a fastener attached to the hairpiece for releasably securing it to the growing hair on the scalp in which the fastener includes a comb as a clamping part thereof for gently but firmly attaching the fastener and thus the hairpiece to the hair. By employing a comb the fastener can be placed as close to the scalp as desired thereby preventing any substantial amount of movement of the hairpiece relative to the scalp.

3,699,979

IMPREGNATED ARTICLE FOR CLEANING THE INTERPROXIMAL SURFACES OF THE TEETH

Joseph C. Muhler, and George K. Stookey, both of Indianapolis, Ind., assignors to Indiana University Foundation, Bloomington, Ind.

Filed April 8, 1971, Ser. No. 132,442

Int. Cl. A61c *15/00*

U.S. Cl. 132—89 **10 Claims**

A mixture of a saliva soluble coating material and a specially defined dental polishing and cleaning agent is combined

with a non-wax dental floss or dental tape to produce an impregnated dental floss or dental tape. Saliva dissolves the soluble coating material when the impregnated floss or tape is used to clean and polish the interproximal surfaces of the

teeth by exposing the polishing agent to direct contact with the dental surfaces. Utilization of a saliva soluble coating material thereby substantially increases the cleaning and polishing properties of the dental floss or tape containing the cleaning and polishing agent.

3,699,980

LOTION APPLICATOR

Douglas D. Carpenter, 3013 1st Avenue, Great Falls, Mont.

Filed July 21, 1971, Ser. No. 164,630

Int. Cl. A45d *40/26*

U.S. Cl. 132—88.7 **3 Claims**

An elongated flat flexible belt has an elongated applicator pad secured permanently or detachably to one surface thereof. The belt and pad can be rolled up and provided with means for detachably holding belt and pad in rolled up position.

3,699,981

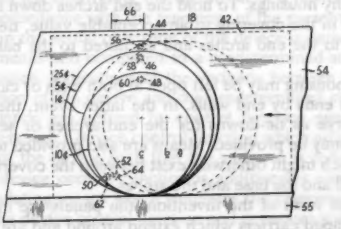
COIN VALUE DETERMINING APPARATUS AND SYSTEM

Barton C. Conant, Westport, and James A. Thomas, Stamford, both of Conn., assignors to Abbott Coin Counter Co., Inc., Greenwich, Conn., by said Conant

Filed March 23, 1970, Ser. No. 21,726

Int. Cl. G07d *9/04*

U.S. Cl. 133—8 **16 Claims**



Apparatus for high speed, high volume coin processing comprises sensor elements adapted for indicating both sizes and positions of coins in continuous non-selective transit. Systems incorporating such apparatus and providing denominational value indication are also disclosed.

3,699,982

METHOD FOR KEEPING PAINT TANKS CLEAN

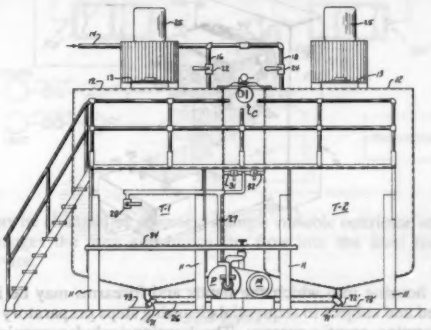
David D. Pipkins, Downers Grove, Ill., assignor to The Valspar Corporation, Rockford, Ill.

Filed Dec. 29, 1969, Ser. No. 888,558

Int. Cl. B08b *7/00*; C23g *5/02*

U.S. Cl. 134—22 R **6 Claims**

Enclosed paint tanks are maintained substantially free of pain residue by heating liquid thinner to vaporize the same, conducting the vapor to the head space of the tank, and causing the vapor to condense on the inside of the tank so that the liquid thinner rinses the side walls and keeps them clean. When the thinner is flammable, an inert gas is fed into the head space to maintain an inert protective atmosphere therein. The disclosed apparatus includes a pair of large, enclosed storage tanks each having an impeller and a common paint supply line. Conduits interconnect the tanks and a pump



is provided for discharging the paint from either tank. The lowermost conduit has a storage chamber at either end and a ball is propelled between the chambers to loosen residue in the conduit. At the top of the tanks is a container for the liquid thinner. A float in the container maintains the level of the liquid thinner. A float in the container maintains the level of the liquid thinner. A heating element in the container is adapted to vaporize the thinner. Conduits lead from the container to the tanks to feed the vapor thereto.

3,699,983

WET PROCESSING INSTALLATION

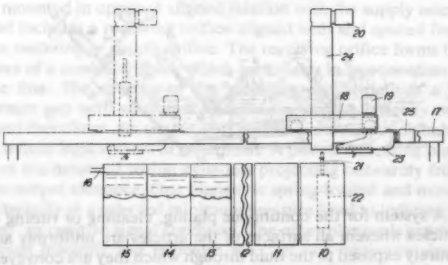
Cyril William James Morley, 59 Yockley Close, Camberley, England

Filed June 15, 1971, Ser. No. 153,276

Claims priority, application Great Britain, June 19, 1970, 29,962/70

Int. Cl. B08b *3/02*

U.S. Cl. 134—76 **10 Claims**



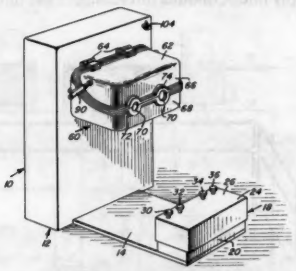
An installation for wet processing, such as electroplating, in which a plurality of wet processing tanks are arranged in a line and a single rinsing zone is arranged at one location in the line. A trolley is movable over the tanks and rinsing zone and includes lifting mechanism carried by the trolley to lift and lower a workpiece out of and into a tank beneath the trolley to and from a location above the level of the tops of the tanks. A drip tray is carried by the trolley for movement therewith and is movable between a first position permitting the lifting and lowering of a workpiece, and a second position beneath the lifted workpiece to catch any drips therefrom as the trolley moves over the various tanks.

3,699,984

CLEANING AND STERILIZING DEVICE

Charles T. Davis, 1150 N. Country Club Drive, Mesa, Ariz.

Filed Jan. 12, 1971, Ser. No. 105,830
Int. Cl. B08b *13/00*
U.S. Cl. 134—95 10 Claims



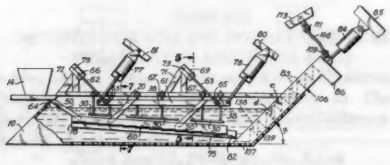
A housing into which the hands and forearms may be inserted and subject to sequential cleansing steps preparatory to performing aseptic surgery. The housing includes openings through which the forearms are sealing received and spray cleaning means for sequentially spraying soap, bacteroicide and alcohol solutions completely about the external surfaces of the hands and adjacent forearms portions disposed within the housing. In addition, means is provided whereby heated and filtered air may be subsequently blown over the cleansed forearms and hands prior to their being removed from within the housing.

3,699,985

CONTINUOUS PLATING SYSTEM

Elbert R. Faust, Litchfield, Conn., assignor to M&T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 796,033, Feb. 3, 1969, Pat. No. 3,616,423. This application March 3, 1971, Ser. No. 120,635
Int. Cl. B65g *49/02*; B08b *3/04*
U.S. Cl. 134—141 9 Claims



A system for the continuous plating, cleaning or rinsing of articles wherein all surfaces of the articles are uniformly and entirely exposed to the fluid through which they are conveyed. A trough suspended within a fluid bath is operative to cyclically move forward and upward and abruptly return to its initial position thereby to cause articles in the trough to inertially fall to positions successively forward of the trough and in new positions with respect to the trough and other articles.

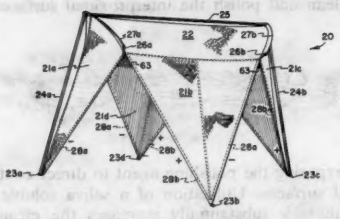
3,699,986

MODULAR SHELTER SYSTEM

Arthur J. Kirkham, 24 West Fifth South, Salt Lake City, Utah

Filed Jan. 6, 1971, Ser. No. 104,298
Int. Cl. A45f *1/00*; E04b *1/347*
U.S. Cl. 135—1 R 10 Claims

A number of tent modules are arranged to be interconnected, as desired, to form various arrangements of combined shelter configurations. A single modular unit can be used and other modules can be acquired as necessary to accommodate



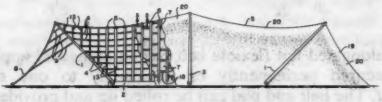
immediate and subsequently changing needs or to lay out a shelter structure conforming to the natural terrain and terrain obstacles.

3,699,987

HOUSING WITH CABLE SUSPENDED PANELS

Carl F. Huddle, Pleasant Ridge, Mich., assignor to Tension Structures Co.

Filed Sept. 8, 1970, Ser. No. 70,331
Int. Cl. A45f *1/16*
U.S. Cl. 135—4 R 1 Claim



A housing which includes two arches inclined away from each other at acute angles to the vertical and mounted on the ground or other base so that they may be swung about their leg ends toward and away from this position, cables which extend between the arches and are attached to them, a covering for the housing which consists of rows of panels carried by the cables, and restraining cables which extend transversely of and around the supporting cables and are attached to the panels and the base. In addition to the inclined arches an intermediate arch or arches may be provided especially in relatively lengthy housings. To hold the end arches down and reduce the sag in the covering to an acceptable value, tie-downs attached to the end arches and anchored to the base are provided.

The housing may be left open at both ends or closed at one or both ends by end walls. In the latter event, the end walls may serve as tie-downs for the end arches or separate tie-downs may be provided. Means are also provided to close any gap which might otherwise exist between the covering and the end wall and the base and the arches.

In one form of the invention, the panels are mounted on arch-shaped carriers which extend around and are carried by the supporting cables. In another form, the carriers are dispensed with and the panels are mounted directly on the supporting cables.

3,699,988

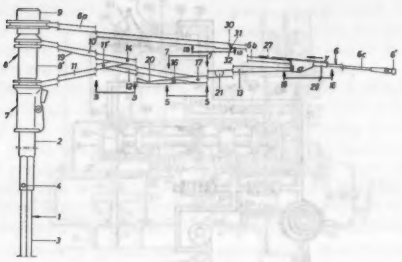
COLLAPSIBLE UMBRELLA

Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada

Filed May 6, 1970, Ser. No. 35,184
Claims priority, application Germany, July 25, 1969, P 19 37 887.1; July 25, 1969, P 19 37 889.3
Int. Cl. A45b *19/04*
U.S. Cl. 135—20 R 14 Claims

A collapsible umbrella having dome ribs in which each dome rib comprises three telescopic members. A supporting stretcher and strut linkage of a parallelogram type wherein

each component of the supporting linkage is of U-shaped cross section and of respective dimensions such that each



component nests in a companion component thereby reducing the diameter of the umbrella when it is collapsed in a closed condition.

3,699,989

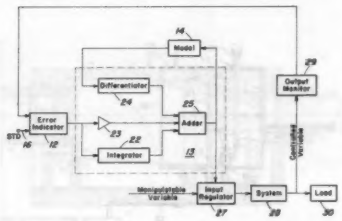
FEEDBACK CONTROL APPARATUS

Ward F. O'Connor, Deanville, N.J., and William George Van Vliet, Greenwich, Conn., assignors to The Lummus Company, Bloomfield, N.J.

Filed June 18, 1970, Ser. No. 47,238

Int. Cl. G05b *11/42*

U.S. Cl. 137—487.5 **23 Claims**



Apparatus for controlling the operation of a device is disclosed in accordance with the teachings of the present invention wherein the actual operation of the device is detected by detecting means and compared to a predetermined standard of performance. Indications of the variance between the actual operation of the device and the predetermined standard of performance are utilized by control function generating means to generate a device control function which adjusts the operation of the device such that the variance is reduced to zero. The device control function is additionally applied to device simulating means which simulates the response of the device to the device control function and generates a simulating function representative of that response. The control function generating means combines the simulating function with the indicated variance to produce the control function which includes a substantially noise-free component indicative of the rate of change of the operation of the device thereby anticipating the future operation of the device.

3,699,990

FLUID MIXER

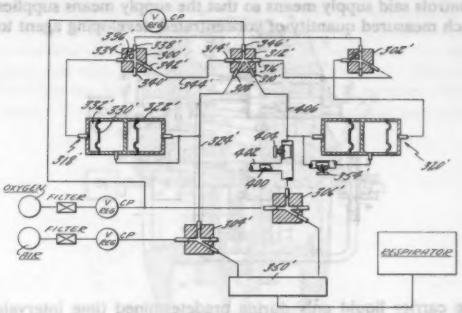
Hermann Ziermann, Cheshire, Conn., assignor to General Medical Corporation

Continuation-in-part of Ser. No. 8,569, Feb. 4, 1970, Pat. No. 3,626,963. This application April 1, 1971, Ser. No. 130,150

Int. Cl. F15c *1/12*

U.S. Cl. 137—81.5 **5 Claims**

Mixing of two or more gases is accomplished by controlling the switching frequency of fluid amplifiers metering the different gases by fluid timing devices. The percentage of gases



may be changed by adjusting a single variable restrictor which changes the area and hence the flow into the fluid timing device.

3,699,991

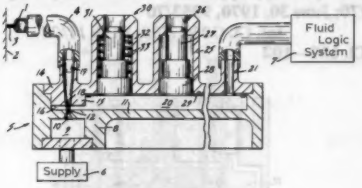
SUPPLY CONNECTION MEANS FOR BLEED TYPE SENSING APPARATUS

Otto R. Munch, Milwaukee, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Aug. 28, 1970, Ser. No. 67,911

Int. Cl. G05b *11/44*

U.S. Cl. 137—82 **3 Claims**



A pneumatic nozzle is connected by a line to a supply and load connection apparatus which includes a supply nozzle connected to an air source to establish a jet. A receiver nozzle is mounted in opposed aligned relation with the supply nozzle and includes a receiving orifice aligned with and spaced from the metering or supply orifice. The receiving orifice forms the apex of a conical diffuser which terminates in a connection to the line. The spacing of the receiving orifice defines a jet stream gap with an output chamber extending laterally outward therefrom. An output port connects the output chamber to a fluid logic system or other load. A pair of indicating plungers are mounted within cylinders projecting outwardly from the output chamber. One plunger is spring-loaded and moves outwardly at a selected minimum pressure level to indicate an "on" or positive signal condition. The other plunger is gravity-biased inwardly and indicates the "off" or minimum signal condition.

3,699,992

ELECTROPHOTOGRAPHIC APPARATUS

Wilhelm Josef Knechtel, Rodheim, and Detlef Schaffer, Wetzlar, both of Germany, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 13, 1970, Ser. No. 54,336

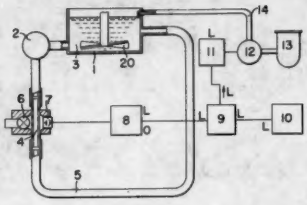
Claims priority, application Germany, July 16, 1969, P 19 36 167.2

Int. Cl. G05d *11/08*

U.S. Cl. 137—93 **11 Claims**

A photocopying apparatus which comprises supply means for supplying a predetermined quantity of concentrated

developing agent to carrier liquid at a predetermined time interval, and measuring means for continuously measuring the concentration of the developing liquid. The measuring means controls said supply means so that the supply means supplies such measured quantity of concentrated developing agent to



the carrier liquid only during predetermined time intervals and then only where the developing liquid has lower than a predetermined value of concentration. The carrier liquid is independently supplied in a quantity equal to the consumption of the carrier liquid, whereby constant concentration of the developing solution is maintained.

3,699,993

CONTROL VALVE FOR THE FLOW TO AND FROM A VARIABLE PRESSURE CHAMBER

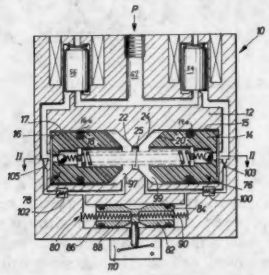
Erich Herion, Stuttgart, and Erich Ruchser, Stetten/Remstal, both of Germany, assignors to Technomatic AG, Aesch/Luzern, Switzerland

Filed Dec. 31, 1970, Ser. No. 103,222

Claims priority, application Switzerland, May 6, 1970, 6935/70; June 30, 1970, 9953/70

Int. Cl. G05d *7/00;* **F15b** *11/08*

U.S. Cl. 137—102 **22 Claims**



A control valve has two valve pistons disposed on opposite sides of a straight passage which is connected at one end with an expanding and contracting pressure chamber of a hydraulic press or brake system, and has a discharge opening at the other end. The valve pistons have a first position in which fluid from the contracting pressure chamber can flow with minimal resistance through the straight passage and out of the discharge opening. In a second position of the valve pistons, the discharge opening is closed by the same, and pressure fluid can be supplied from an inlet through control valves into the straight passage and from there to the expanding pressure chamber.

3,699,994

LINE PRESSURE REGULATOR VALVE

Yohichi Mohri, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa-ku, Yokohama, Japan

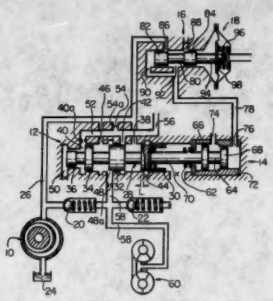
Filed Jan. 26, 1971, Ser. No. 109,832

Claims priority, application Japan, Jan. 30, 1970, 45/7750

Int. Cl. B60k *17/00;* **G05d** *11/00*

U.S. Cl. 137—115 **4 Claims**

A line pressure regulator valve for regulating a line pressure in a hydraulic control system for an automotive automatic power transmission, wherein a valve spool is adapted to move for initially allowing a relatively high rate of fluid flow to servo motors actuating friction elements and subsequently decreasing the rate of fluid flow to the servo motors with the line pressure concurrently increased whereby a gradual engagement of the friction elements is established to provide smooth shifting between a plurality of gear ratios.



3,699,995

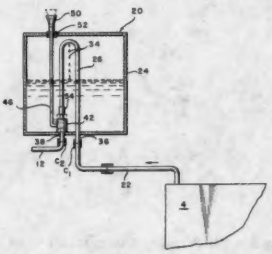
FUEL RESERVE DEVICE AND SYSTEM

Wilbur Brandt, 207 University Boulevard West, Silver Spring, Md.

Filed Jan. 7, 1971, Ser. No. 104,612

Int. Cl. B65d *25/00*

U.S. Cl. 137—256 **6 Claims**



The device is an inexpensive, reliable and simply constructed fuel reserve system for internal combustion combustion engine powered devices, most generally motor vehicles; the device comprising a reservoir, a filling tube and a manually-operated valve for releasing the contents of the reservoir when the main fuel supply is exhausted.

3,699,996

VALVE APPARATUS INCLUDING SELF-INSTALLING MECHANISM

Charles M. Nichols, P.O. Box 3, Linden, Ala.

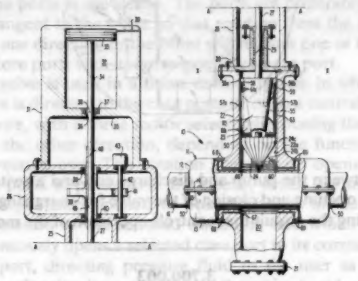
Filed July 27, 1971, Ser. No. 166,498

Int. Cl. F16e *41/04;* **B23b** *41/08*

U.S. Cl. 137—318 **10 Claims**

Valve having provision to cut its own installation hole so that the valve can be installed in an existing pipe line without removing the pipe line from service. A cutting tool is provided at an end of the valve apparatus, and motors are provided which move the cutting tool both rotationally and axially to cut a valve installation hole in the pipe. Provision is made for

sealing the valve seat after the hole has been cut and the valve seat positioned, and for removing the cutting tool if desired.



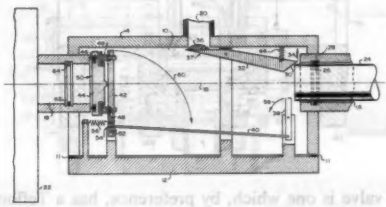
Once the installation is completed, the axial edn rotational motive apparatus can be removed and replaced with conventional valve actuating apparatus.

3,699,997

AUTOMATED VACUUM PORT

William P. Kruger, Los Altos Hills, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed June 22, 1971, Ser. No. 155,446
Int. Cl. F16k *51/00*
U.S. Cl. 137—320 **5 Claims**



An evacuable chamber having two coaxial ports and a roughing port permits a user to insert a probe into a vacuum system without bringing the vacuum system to atmospheric pressure. When the probe is inserted into the first coaxial port it actuates a valve on the roughing port to connect the chamber with a vacuum roughing pump. A vacuum tight seal is also formed between the probe and the first coaxial port when the probe is inserted. Further insertion of the probe is prevented by a stop until the chamber is evacuated. The stop is released, and a valve between the chamber and the second coaxial port is opened upon evacuation of the chamber. The probe can then be inserted into the vacuum system connected to the second coaxial port. When the probe is removed, the valve on the second coaxial port is closed by a spring, and then the valve on the roughing port is closed by a spring. When the probe is removed from the first coaxial port, the chamber returns to atmospheric pressure, which aids in closing both valves tightly.

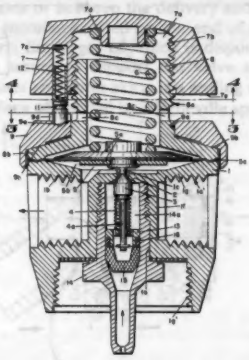
3,699,998

CALIBRATED PRESSURE REGULATOR

Frank Baranowski, Jr., 7 Pine Street, Lynnfield Center, Mass.

Filed Dec. 11, 1970, Ser. No. 97,107
Int. Cl. F16k *31/365*
U.S. Cl. 137—327 **6 Claims**

A miniaturized pressure regulator capable of being calibrated and thus making it possible to dispense with an additional pressure gauge, if desired. The components of the pressure regulator are maintained in position by leaf spring fasteners making it possible to quickly assemble and disassemble the pressure regulator.

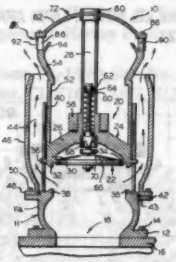


3,699,999

VERTICAL JET BREATHER VALVE

Evald Dunkelis, Glen Ellyn, Ill., assignor to GPE Controls, Inc., Morton Grove, Ill.

Filed March 8, 1971, Ser. No. 122,047
Int. Cl. F16k *17/194, 17/196*
U.S. Cl. 137—493.4 **7 Claims**



A vertical jet breather valve capable of relieving sub-atmospheric and super-atmospheric pressures within a tank, and including a tank vapor-air mixing annular outlet opening for relieving super-atmospheric pressures and creating substantially constant velocity by self-adjusting the outlet opening proportioned to the tank vapor volume or filling rate.

3,700,000

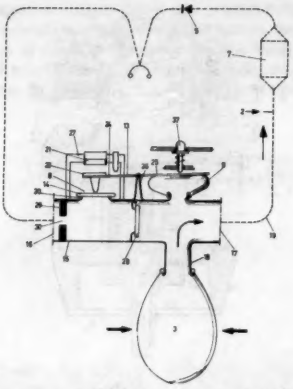
VALVE ARRANGEMENT, ESPECIALLY FOR USE IN ANAESTHETIC GAS SUPPLY SYSTEMS

Holger Hesse, deceased, late of Skovtoftebakken 19, Virum, Copenhagen, Denmark (by Ruth Lea Hesse, heiress and executrix), and Henning M. Ruben, Skodsborg Strandveg 260, Copenhagen, Denmark

Filed March 3, 1969, Ser. No. 804,741
Claims priority, application Great Britain, March 4, 1968, 10,419/68
Int. Cl. A62b *7/00*; A61m *17/00*
U.S. Cl. 137—494 **30 Claims**

A blow-off valve which vents excess gas to the atmosphere when the pressure in a gas circulation system, such as an anaesthetic supply system, exceeds a certain value, as occurs when the patient breathes out, is improved by providing a system to close the valve when the pressure exceeds a still

higher value, as occurs when gas is forced into the patient's lungs. A movable member is exposed to the gas pressure in the



system. A force transfer means connects the movable member in the valve and closes the valve when this higher pressure is reached.

3,700,001

CHECK VALVE

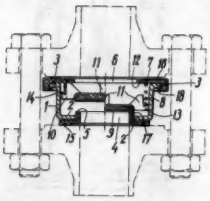
Kurt Rudel, Bremen, Germany, assignor to Gustav F. Gerdts KG, Bremen, Germany

Filed Sept. 1, 1970, Ser. No. 68,685

Claims priority, application Germany, Sept. 4, 1969, P 19 44 774.6

Int. Cl. F16k *15/02, 17/04*

U.S. Cl. 137—543.21 **1 Claim**



A check valve adapted to be fixed between flanges of two pipes is provided with an annular casing and a valve plate guided by ribs and cooperating with a valve seat provided in the casing. A closure spring has a free end engaging a member provided in the casing. The invention is particularly characterized in that the valve casing consists of a metallic tubular body having at one end an annular member consisting of elastic material and serving as a valve seat and at the other end an annular member consisting of elastic material and serving as a spring support. The two annular members engage a spring and cooperate with a valve plate which also consists of elastic material.

3,700,002

LIQUID SUPPLY SYSTEM WITH MOTOR OPERATED PUMP ACTUATED BY SWITCH CONTROLLED BY ON-OFF VALVE IN SYSTEM

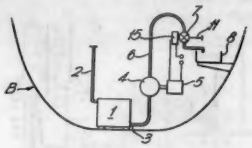
Colin McMaster Christie, London, England, assignor to Aqua-Marine Mfg. Limited, Toronto, Ontario, Canada

Filed Jan. 4, 1971, Ser. No. 103,502

Int. Cl. E03b *11/16*

U.S. Cl. 137—565 **6 Claims**

A liquid supply system includes a reservoir, a pipe connected to the reservoir and having a discharge end above the reservoir, a pump in the pipe between the reservoir and discharge end, a motor for driving the pump, a valve in the



pipe between the pump and discharge end and a switch actuated by opening and closing of the valve for energizing and de-energizing the circuit that controls operation of the motor.

3,700,003

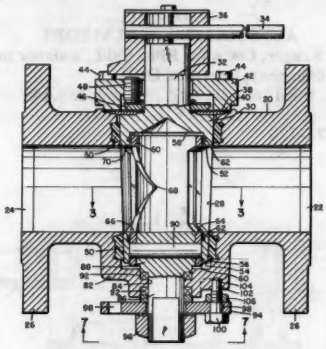
VALVE WITH FLOW REGULATING MEANS

Russell G. Smith, 2805 Digby Avenue, Cincinnati, Ohio

Continuation-in-part of Ser. No. 851,951, Aug. 21, 1969, abandoned. This application April 15, 1971, Ser. No. 134,364

Int. Cl. F16k *5/02, 31/44, 5/10*

U.S. Cl. 137—614.17 **25 Claims**



The valve is one which, by preference, has a Teflon liner forming a self-lubricating seal within which the hollow valving member rotates; and included in the structure is a flow regulator in the form of a replaceable or adjustable orifice sleeve which normally is embodied wholly within the axial bore of the hollow valving member.

3,700,004

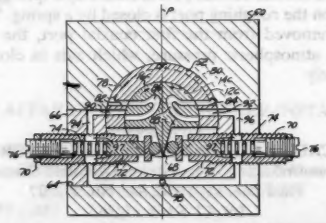
VALVE STRUCTURE AND BOOST CONTROL SYSTEM

John D. Tobias, Royal Oak, Mich., assignor to John P. O'Hara, Jr. and Genevieve M. O'Hara, Bloomfield Township, Oakland County, Mich., part interest to each

Filed Dec. 11, 1970, Ser. No. 97,140

Int. Cl. F16k *11/02*

U.S. Cl. 137—625.23 **17 Claims**



A spool valve having a sleeve member and a core member, with ports formed from two longitudinally spaced perforations

extending transversely of the members parallel to and offset on opposite sides of a longitudinal plane containing the axes of the members such that, when the core is rotated 180° for use, the ports in the core are offset on opposite sides of the plane from the ports in the sleeve. The ports are preferably formed to be tangent to the plane so that rotation from the use position to one direction or the other will register one or the other of the core ports with its corresponding sleeve port.

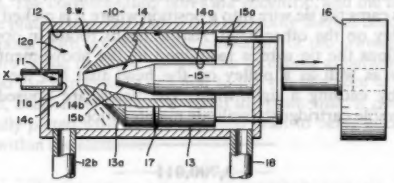
The valve is used in a boost control system in which fluid pressure is directed to the core ports through a central longitudinal bore, with a force motor selectively rotating the core in one or the other direction, depending on the functions of a fluid pressure user. This rotation alternatively opens the sets of core ports to passages in the sleeve, which are simultaneously respectively opened to boost passages in the core to assist rotation in the selected direction, and which rotation simultaneously opens a selected core port to its corresponding sleeve port, directing pressure fluid to the user as needed. Rotation also simultaneously opens the active boost passage to a sleeve passage directing fluid to a core return piston for rotating the core back to its initial position.

3,700,005

GAS FLOW CONTROL DEVICE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and John B. Wellman, 2121 Valderas Drive #90, Glendale, Calif.

Filed Aug. 10, 1971, Ser. No. 170,440
Int. Cl. F17d *1/10, 1/00*
U.S. Cl. 137—608 **8 Claims**



A gas flow control device is disclosed comprising a housing with an input port through which gas enters the housing. At the input port the subsonic gas flow is converted into supersonic flow. The housing includes a movable probe with a conical external surface which produces a shockwave when impinged by the supersonic gas flow. The probe has a cavity with a shape of a truncated cone with the top of the cone serving as the cavity input. Mounted in the housing and surrounded by the probe is a mandrel with a truncated cone-shaped top, whose surface corresponds to the cavity surface. By moving the probe toward and away from the input port, the rate of gas flowing to an output port is controlled. The shockwave prevents disturbances due to changes in the gas flow rate from advancing upstream.

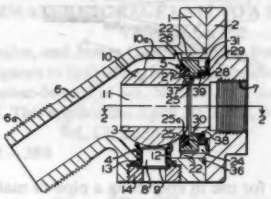
3,700,006

ANGLE COCK

Roger Marcilhaud, Saint Denis, France, assignor to Compagnie Des Freins Et Signaux Westinghouse, Freinville-Sevran, France

Filed May 21, 1970, Ser. No. 39,333
Claims priority, application France, June 17, 1969, 6920195
Int. Cl. F16k *11/08*
U.S. Cl. 137—625.21 **6 Claims**

An angle cock has a body provided with a chamber into which opens an inlet port, a delivery port and an exhaust port. A ball-type valve disposed in the chamber is formed intermediate the ends of a valve stem rotatably mounted in a bore provided therefor in the body. A passageway extends through the ball to provide communication either between the inlet and delivery ports or between the delivery and exhaust ports. A valve cover member carried on the end of a pipe has two concentric skirts the larger of which is disposed in the inlet port and also serves to support the valve stem. Disposed between the inner and outer skirts is a sealing member biased against the surface of the ball by a Belleville spring interposed



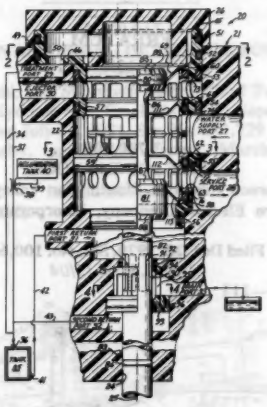
between this sealing member and the cover member. This sealing member includes a piston carrying two resilient annular seals which respectively form seals with the surface of the ball and either a shoulder formed on the cover member or a shoulder formed on the piston accordingly as the pressure in the inlet port exceeds or is less than the pressure in the delivery port. Thus, while in the closed position of the ball valve, flow through angle cock is prevented irrespective of whether the inlet port is subject to pressure or vacuum.

3,700,007

CYCLING VALVE AND VALVING ASSEMBLY FOR WATER SOFTENERS

Raymond T. Sparling, and William A. Dietz, both of Los Angeles, Calif., assignors to Hersey Products Inc., Los Angeles, Calif.

Filed June 19, 1970, Ser. No. 47,751
Int. Cl. F16k *11/07, 3/24*
U.S. Cl. 137—625.29 **14 Claims**



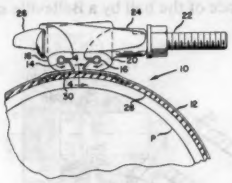
A cycling valve for a water treatment system wherein an axially reciprocable stem bearing a pair of sealing lands is adapted to make selective closures among four sets of lip-seals to cycle a water softener through a cycle beginning with service and extending through back-wash, brine, rinse, quick-rinse and return to service. A valving assembly for use in such a valve comprises a support ring that bears a frusto-conical web forming the lip-seal which has a circular opening which makes an interference fit with the respective land. Lip-seal elements bearing the lip-seals may be stacked inside a body to form a readily assembled device.

3,700,008

PIPE CLAMP WITH IMPROVED GAP BRIDGE

Frank C. Hackman, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.

Filed May 28, 1971, Ser. No. 148,102
Int. Cl. F16l 55/16
U.S. Cl. 138—99 **5 Claims**



A pipe clamp for use in encircling a pipe or main, the pipe clamp being used as a pipe repair clamp or as a clamp for connecting a service line to the main. The pipe clamp comprises a split flexible band means of sheet-metal having at least one pair of confronting ends separated by a gap, the band means being provided on its inner surface with an elastomeric gasket means which seals with the exterior of the pipe or main. Lug means are provided for drawing the pair of confronting ends together to tighten the band means and gasket means about the pipe. An arcuate gap bridge member is interposed between the band means and the gasket means in an area where it spans the gap between the confronting ends. The gap bridge member is provided with a plurality of circumferentially extending and longitudinally spaced stiffening ribs or corrugations on its outer surface. These stiffening ribs function to make the gap bridge member have a uniform high gasket load completely about the edges of the gap bridge and, further, these ribs terminate short of the edges of the gap bridge and thus the low gasket load immediately beneath the ribs is completely confined. By having the ribs provide a surface for the lug means, the operative contact area between the lug means and the gap bridge member is reduced thus reducing the friction and amount of bolt torque necessary to tighten the clamp about the pipe.

ERRATUM

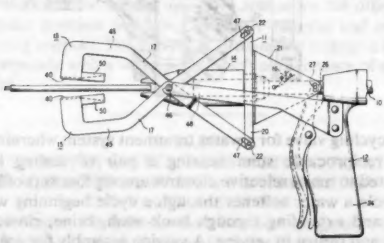
For Class 139—161 see:
Patent No. 3,700,033

3,700,009

WIRE JOINING TOOL

Robert Holbrook Cushman, Huntingdon Valley, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Dec. 22, 1970, Ser. No. 100,660
Int. Cl. B21f 15/04
U.S. Cl. 140—111 **14 Claims**



A hand held, motor driven, wire joining tool is disclosed which includes two wire gripping jaws adapted to twist wires gripped therein by counter-rotating with respect to each other and a heater for melting insulation from the wires as they are twisted.

3,700,010

WIRE TYING APPARATUS INCLUDING DEMOUNTABLE TYING MECHANISM

Benjamin M. Bartilson, and Gerald A. Francis, both of Columbus, Ohio, assignors to The United States of America as represnted by the Secretary of the Army

Filed June 17, 1971, Ser. No. 154,111
Int. Cl. B21f 7/00, 15/04
U.S. Cl. 140—93 A **4 Claims**

An improved apparatus for tightly joining a cluster of wires or cables which utilizes counter-rotating heads to wrap a relatively stiff tie wire around the cluster. A ramp on one of the heads cams the tie wire into a position where it is picked up by a pulley on the other head. As the heads rotate in opposite directions the tie wire is restrained by the above-mentioned pulley as well as a pulley on the head that has the ramp, thereby causing a tight wrap. The heads are housed in a removable cartridge to facilitate maintenance.

3,700,011

TERMINAL STRAIGHTENING METHOD AND MACHINE

George Walter, Chicago, Ill., assignor to Malco Manufacturing Company, Inc., Chicago, Ill.

Continuation of Ser. No. 824,349, April 21, 1969, abandoned.
This application Feb. 16, 1971, Ser. No. 115,747
Int. Cl. B21f 7/00
U.S. Cl. 140—147 **14 Claims**

A method of straightening bent wire-wrap posts of electrical terminals in a group of terminals and a machine for practicing the method. The method contemplates bending posts misaligned with corresponding terminal axes back into alignment with respective axes and then twisting them on said axes through a sequence of twists which culminates in return of the posts to generally their original radial orientation on the respective axes and fixing of the posts in alignment with such axes. The machine performs this method by telescopically engaging all the terminals in a group of terminals with a corresponding group of spindle wrenches. The initial engagement

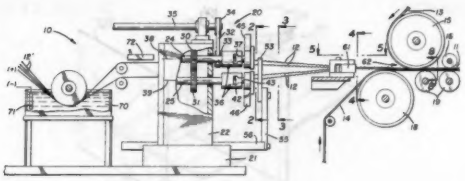
places all wire wrap posts in alignment with corresponding axes. Rotation of the spindle wrenches through a rack and pinion arrangement according to a prescribed sequence is effective to perform the aforedescribed twisting operation on the posts in the group.

3,700,012

APPARATUS FOR PRODUCING HELICALLY FORMED FILAMENTS

Sterling W. Alderfer, Akron, Ohio, assignor to The Steelastic Company, Akron, Ohio

Filed Jan. 7, 1971, Ser. No. 104,602
Int. Cl. B21f 7/00
U.S. Cl. 140—149 **8 Claims**



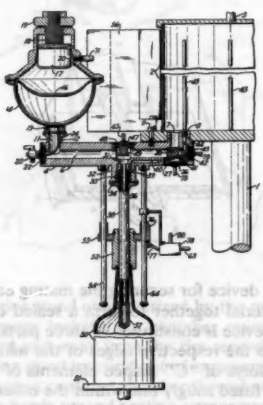
Helical, wire filaments are disclosed that may be encapsulated individually or nested in bundles that are themselves encapsulated within an elastomeric material to provide a reinforced fabric. The method and apparatus by which such filaments are formed pass straight wire, in individual or plural strands, through a bore in a movable working die. Each strand is cold worked around the flared orifice of the bore in the movable die and enters a corresponding bore in a fixed die means. The corresponding bores are eccentric, and the movable die plate is translated such that each bore therein describes an annular path concentrically outwardly of the corresponding bore in the fixed die means. The foregoing apparatus and method are particularly adapted to the manufacture of reinforced, elastomeric fabric, even to the point that, if desired, normally plated wire can be deplated prior to being encapsulated within the elastomer.

3,700,013

PROTECTIVE COATING COMPOSITIONS

Charles R. Coffey, and Thomas C. Tesdahl, both of Cincinnati, Ohio, assignors to Chemed Corporation, Cincinnati, Ohio

Filed Feb. 2, 1971, Ser. No. 112,047
Int. Cl. C08b 21/26
U.S. Cl. 106—2 **15 Claims**



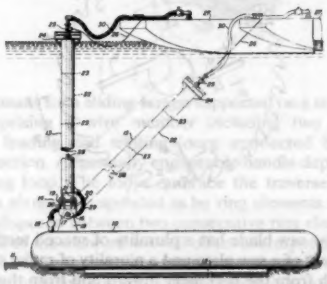
An aqueous dispersion is disclosed especially adapted for use as a protective coating composition in food contact areas of food processing plants. The dispersion contains white mineral oil, a hard wax such as carnauba wax, an ethyl cellulose or ethyl hydroxyethyl cellulose having an ethoxyl or combined hydroxyethoxyl-ethoxyl content of 46.0 to 49.5 weight percent and a viscosity of about 4 to 100 centipoises, a higher (C_{12}—C_2) fatty acid, and a volatile basic amine.

3,700,014

APPARATUS FOR TRANSFERRING FLUID FROM AN UNDERWATER STORAGE UNIT TO A FLOATING VESSEL

Ralph E. Scales, and James O. Whitley, Jr., both of Beaumont, Tex., assignors to Bethlehem Steel Corporation

Continuation-in-part of Ser. No. 853,717, Aug. 28, 1969, abandoned. This application April 30, 1971, Ser. No. 139,074
Int. Cl. B65b 1/04, 3/00
U.S. Cl. 141—388 **8 Claims**



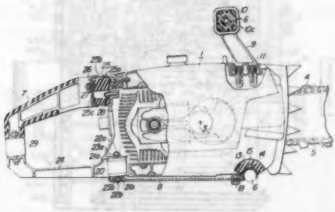
Apparatus for transferring fluid between an underwater storage unit and a floating vessel has a rigid elongated member with its lower end connected to the storage unit through a universal joint, a buoyant chamber on the rigid member, a pipe in communication with the storage unit and the floating vessel attached to and extending along the rigid member, and a cable attached to the floating vessel and the upper end of the rigid member.

3,700,015

VIBRATION ABSORBING DEVICE FOR PORTABLE MACHINES

Torao Kobayashi, and Masatoshi Sato, both of Tokyo, Japan, assignors to Kyoritsu Noki Co., Ltd., Tokyo, Japan

Filed July 12, 1971, Ser. No. 161,729
Claims priority, application Japan, March 9, 1971, 46/12620
Int. Cl. B27b 17/02
U.S. Cl. 143—32 R **1 Claim**



A vibration absorbing device for portable machines of the type accommodating a vibration generating source therein and having a front handle and a rear handle, wherein said front and rear handles are secured to the main body of the machine independently of each other and through resilient buffer members respectively, while the main body of the machine is provided with seats for the respective resilient buffer members on the rear and bottom walls thereof over re-

gions extending transversely of the main body. The front handle extends transversely of the main body to surround one side surface of said main body, while the rear handle extends perpendicularly of said front handle. Each of the resilient buffer member is so designed so to provide sufficiently rigid connection between the respective handle and the main body.

3,700,016

DOUBLE SLOTTED SAW

Keene S. Strobel, Everett, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed July 26, 1971, Ser. No. 166,164
Int. Cl. B27b *33/08*
U.S. Cl. 143—140 R **5 Claims**

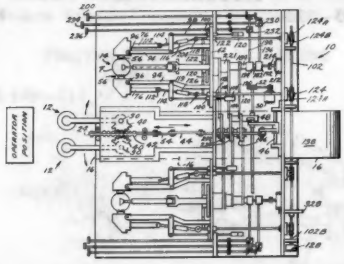
A circular saw blade has a plurality of spaced teeth around the periphery of a saw plate and a plurality of radial slots positioned both from the periphery inward and from the eye outward; the slots preferably being faced on the cutting side with a facing element extending substantially the length of the respective slot with the facing element having a width substantially the same or slightly less than the width of the kerf of the cutting teeth.

3,700,017

CITRUS FRUIT PEELING MACHINE

Daniel B. Vincent; Daniel A. Vincent, and George C. Roberts, all of Tampa, Fla., assignors to Consolidated Machines, Inc., Tampa, Fla.

Filed Aug. 5, 1970, Ser. No. 61,048
Int. Cl. A23m *7/00*
U.S. Cl. 146—3 M **10 Claims**



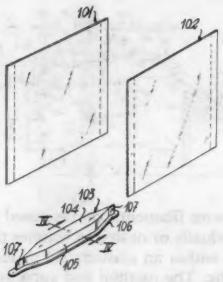
By preference the device includes two substantially alike sections which accept two unpeeled fruit and swing them into peeling position. Here, the fruits are each accepted by opposed spike chucks which are initially sharply thrust into the peel, followed by some relaxation. As the fruit is rotated on the chucks, two knives move across the rotating fruit to an adjustable depth cutting peel therefrom toward the spikes. The edges of two additional knives finally pass under the spikes to cut the ball of fruit from the peel buttons held by the spikes. Plungers push the buttons from the spikes and the fruit balls and peel buttons fall to a conveyor for mechanical separation.

3,700,018

SEMIRIGID CONTAINER

Luigi Goglio, Via Solari 10, Milan, Italy

Filed Jan. 6, 1971, Ser. No. 104,438
Claims priority, application Italy, Jan. 14, 1970, 20494 B/70; Feb. 18, 1970, 20779 A/70; March 23, 1970, 22316 A/70
Int. Cl. A45c
U.S. Cl. 150—.5 **11 Claims**



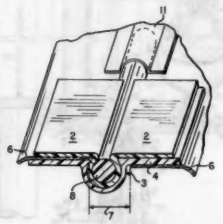
Completely heat-welded, semirigid tight container for foodstuff. The container comprises a pre-shaped bottom of thermoplastic material which can be heat-welded, as well as a top containing portion, at least partly formed of heat weldable material consistent with that the bottom, formed of a preferably tubular element which at one of its ends is heat-welded to the bottom and provided with a top opening suitable to be closed by transverse heat-welding upon completion of product stuffing.

3,700,019

CLOSURE FOR FLEXIBLE CONTAINER

William Paul Robbins, 5047 Manchester Road, Middletown, Ohio, and Clifford Ralph Bullock, 522 Cheshire Avenue, Fort Walton Beach, Fla.

Continuation-in-part of Ser. No. 842,181, July 16, 1969, abandoned. This application Jan. 20, 1971, Ser. No. 107,919
Int. Cl. B65d *33/16*
U.S. Cl. 150—3 **8 Claims**



A fastening device for securing the mating edges of a sheet of plastic material together to form a sealed container. The structure or device is constituted of three parts, two of which are secured to the respective edges of the material as strips, and take the form of "C" shaped elements of different sizes which can be fitted snugly one within the other. These members have flat extensions to which the edges of the plastic sheets are secured. The third member is constituted of a rod of rubber or similar stretchable material which when stretched longitudinally will temporarily reduce its diameter so that it

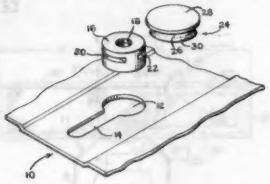
can be pressed into the circular opening formed within the inner "C" shaped member. When the stretching force is removed, the rod will increase its diameter to press the inner member against the outer member and provide a sealed joint between the two members and the mating edges of the material to which they are attached.

3,700,020

BOLT ANCHOR ASSEMBLY

Richard M. Wallace, 10 Lillian Drive, Binghamton, N.Y.

Filed Aug. 24, 1970, Ser. No. 66,315
Int. Cl. F16b *39/00*
U.S. Cl. 151—41.7 1 Claim



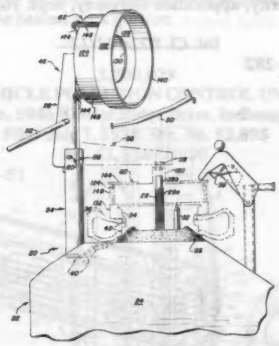
An assembly for firmly anchoring a bolt, especially in sheet metal or other relatively thin stock. A keyhole-shaped opening is provided in the base and a special nut is inserted in the large part of the opening and moved laterally into the elongated narrower part with grooves in each side of the nut engaging the base on each side of the elongated opening. A resilient plug of rubber or plastic is inserted into the large part of the opening to prevent movement of the nut.

3,700,021

TIRE SERVICING AND INFLATING APPARATUS

Gilbert M. Motis, Westlake Village, Calif., assignor to The Coats Company, Inc.

Filed March 8, 1971, Ser. No. 121,872
Int. Cl. B60c *25/12*
U.S. Cl. 157—1.1 8 Claims



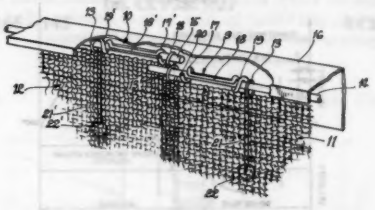
A tire changing stand characterized by the provision of an inflation accessory including a chamber member which is movable toward and away from the rim receiving surface of the tire changing stand into and out of engagement with a tire side wall to create a confined chamber thereabout and to urge one of the tire beads toward seating engagement with its related rim bead seat so that the influx of air under pressure through the rim valve stem may serve to seat and inflate the tire held thereon.

3,700,022

DRAW MEANS FOR SLIDING SCREEN AND THE LIKE

Randall H. Eaves, Des Plaines, Ill., assignor to DeSota, Inc., Des Plaines, Ill.

Filed March 8, 1971, Ser. No. 122,002
Int. Cl. A47h *5/00*
U.S. Cl. 160—126 9 Claims



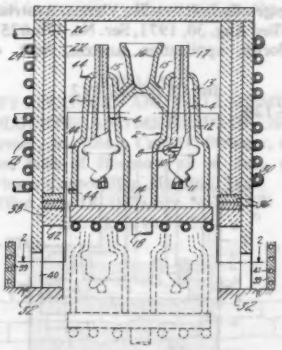
Draw means for a sliding screen supported on a traverse rod and comprising a wire member including two co-axially disposed leading and trailing loops connected by a rigid straight section. A manually engageable handle depends from the trailing loop. The loops embrace the traverse rod from which the screen is suspended as by ring elements. The draw means is disposed between two consecutive ring elements and movement of the draw means will effect corresponding sliding movement of the screen. In a modified embodiment the leading loop is provided with an extension which is connected to the screen.

3,700,023

CASTING OF DIRECTIONALLY SOLIDIFIED ARTICLES

Anthony F. Giamei, Middletown, and Bruce E. Terkelsen, Cheshire, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 12, 1970, Ser. No. 63,142
Int. Cl. B22d *25/06*
U.S. Cl. 164—60 8 Claims

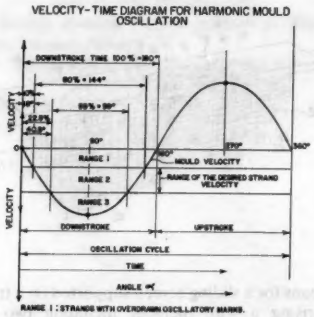


The cooling cycle for directionally solidified castings is improved by lowering the temperature of the mold adjacent to the chill plate at the beginning of the solidification while maintaining the high temperature in the greater portion of the mold and then further cooling the mold near the chill plate during continued solidification to increase the heat removal and thereby maintain the desired high thermal gradient.

3,700,024
METHOD OF CONTINUOUSLY CASTING STEEL BILLETS

Bernard Knell, Thalwil, Switzerland, assignor to Concast AG, Zurich, Switzerland

Filed Oct. 16, 1969, Ser. No. 867,073
Int. Cl. B22d *11/02*
U.S. Cl. 164—83 **3 Claims**

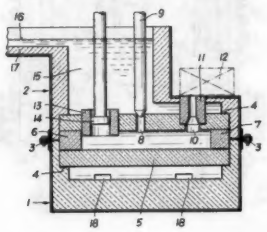


In continuously casting steel billets wherein the mold is oscillated up and down substantially according to a sine function the mean speed of descent of the mold is selected so that the maximum speed of withdrawal of the casting from the descending mold during not less than about 55 percent, and the minimum speed during not more than about 80 percent, of the time required for the complete descent of the mold is below the speed of the mold. Further, the level of liquid steel in the mold is preferably kept constant by adjusting the withdrawal speed of the casting in accordance with the rate of delivery of liquid steel into the mold; if the withdrawal speed of the casting exceeds the desired maximum or falls below the desired minimum, further delivery of liquid steel to the mold is stopped.

3,700,025
METHOD OF CASTING QUIET MELTS

Oscar Tenner, Rossatz, Austria, assignor to Gravicast Patentverwertungsgesellschaft m.b.H., Vienna, Austria

Filed Aug. 30, 1971, Ser. No. 176,025
Claims priority, application Austria, Sept. 4, 1970, A 8047/70
Int. Cl. B22d *27/12*
U.S. Cl. 164—120 **4 Claims**

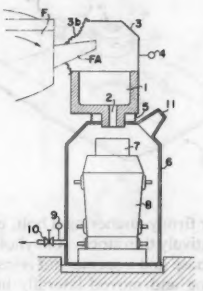


The melt to be cast is dammed up in a supply chamber so as to flow by its own weight through an equalization chamber and from the latter through a nozzle into a mold. The melt is brought to a quiet condition before it reaches the mold by interrupting the flow of the melt into the equalization chamber and after the mold has been filled, a return flow of the melt into the equalization chamber is prevented by subjecting the melt in equalization chamber and in the mold to an increased pressure and the melt in the gate cross section of mold has solidified.

3,700,026
INGOT CASTING APPARATUS

Toshio Adachi; Kiyohide Hayashi, and Yukio Okura, all of Nagoya, Japan, assignors to Daido Seiko Kabushiki, Aichi-ken, Japan

Filed Dec. 22, 1970, Ser. No. 100,713
Claims priority, application Japan, Dec. 25, 1969, 44/122378
Int. Cl. B22d *27/16*
U.S. Cl. 164—256 **4 Claims**

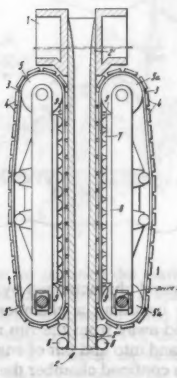


An ingot casting apparatus in which protecting gases used in melting metals are introduced into a sealed casting vessel through a specially design sealed ladle or tundish connected with the vessel and through a spout of the remelting furnace which is also connected with the ladle or tundish in a completely gas-sealed condition, and molten metal is cast under an evacuated or inert gas atmosphere.

3,700,027
CONTINUOUS CASTING MACHINE

Ulrich Petersen, Dusseldorf-Lohausen, Germany, assignor to Maanesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 13, 1971, Ser. No. 179,957
Claims priority, application Germany, Sept. 16, 1970, P 20 46 645.9
Int. Cl. B22d *11/12*
U.S. Cl. 164—282 **10 Claims**



In a continuous casting machine, having a mold and means for withdrawing and guiding a casting emerging and lowered from the mold, a pair of endless belts or chains carrying plates

and disposed on opposite sides of and along and urged against the casting for the plates to engage the casting, the belts running in synchronism with the lowered casting; the plates having relief profile to engage the casting with less than the entire surface area of a plate, preferably with about 10 to 30 percent thereof, there being protrusions and indentations for a coolant to flow around the protrusions in contact with the casting.

3,700,028

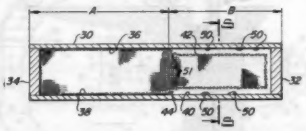
HEAT PIPES

Don W. Noren, Redwood City, Calif., assignor to Noren Products, Inc., Redwood City, Calif.

Filed Dec. 10, 1970, Ser. No. 96,836

Int. Cl. F28d *15/00*

U.S. Cl. 165—32 **4 Claims**



The specification and drawings disclose two embodiments of heat pipe structures arranged to readily conduct heat in one direction and conduct only a limited amount of heat in the opposite direction. In both embodiments, the heat pipe is shown as comprising a hollow, sealed tube having wick material positioned in engagement with selected portions of the inner surface. A vaporizable fluid is placed in the tube in an amount sufficient to wet the wick. In one embodiment, the wick extends over and is in engagement with only those portions of the wall surface from which it is desired to transfer heat. The other portions of the wall surface are bare. Consequently, fluid in the wick can be vaporized and flow to the bare wall portion for condensation. However, if the bare wall portions are at a higher temperature, heat cannot be transferred to the wicked portion except by conduction through the tube wall. In the second embodiment, the entire inner surface is covered by a wick but in certain areas, the wick is spaced from the surface. The spaced areas function in the manner of the bare areas of the first embodiment but allow the unit to be used in any orientation since droplet formation in the spaced wick areas permit the droplets to engage the spaced wick for capillary flow to the heated wick portion.

3,700,029

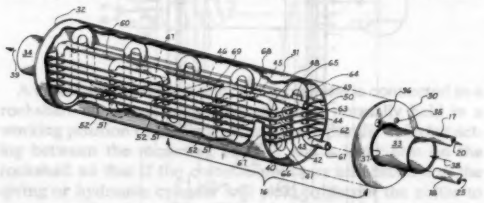
VEHICLE POLLUTION CONTROL UNIT

Paul H. Thrun, 5946 Kessler Ridge Drive, Indianapolis, Ind.

Filed July 7, 1970, Ser. No. 52,895

Int. Cl. F28f *19/00*

U.S. Cl. 165—51 **6 Claims**



An apparatus for controlling the pollutants in engine exhaust gases. A housing contains a hollow tube having heat transfer plates attached which extend the length of the housing. Baffles are positioned along the length of the housing between the heat transfer plates. The housing is capped on both ends and is provided with an inlet and outlet pipe for the exhaust gases to pass through. A fluid coolant is circulated through the tube to cool the exhaust gases within the housing.

3,700,030

HEAT EXCHANGER SUPPORT STRUCTURE

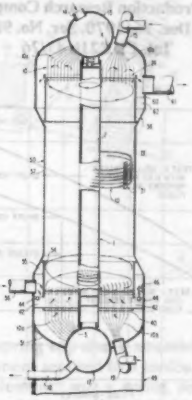
Maurice Bosquain, Paris; Marcel Bourjot, La-Varenne-Saint-Maur, and Maurice Kirsch, Champigny-sur-Marne, all of France, assignors to L'Air Liquide, Societe Anonyme pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Filed July 28, 1970, Ser. No. 58,777

Claims priority, application France, Nov. 13, 1969, 69 38 976; July 9, 1970, 7023900

Int. Cl. F28f *9/22*

U.S. Cl. 165—145 **8 Claims**



The present invention relates to a heat exchanger of the type involving a nest of tubes formed from concentric layers of wound pipes, in which the pipes in each layer are attached, generally near their ends, by being fitted between two successive crowns in a series of crowns, with the inside edge of one crown extending round the outside edge of the crown it fits on to, so as to form a plate reaching out transversally from the core. The pipes in each of the wound layers preferably rest in the concave sections of ridged uprights laid lengthwise along the core, and fitted between each pair of layers, or between the first layer of pipes and the core, the said ridged uprights being attached at their ends to the crowns holding the ends of the pipes.

These measures provide a rigid structure, in which the tubes are firmly held in position with respect to the core of the exchanger.

3,700,031

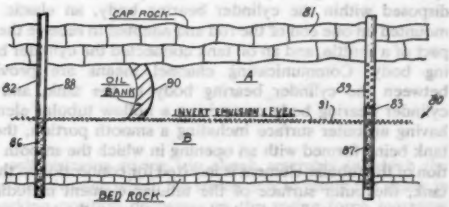
SECONDARY RECOVERY AND WELL STIMULATION, SOLUTIONS, AND METHODS OF USE

Walter F. Germer, Jr., Edna; Carl W. Stringer, and William H. Harrison, both of Houston, all of Tex., assignors to Germer-Stringer Corporation, Houston, Tex.

Filed June 18, 1970, Ser. No. 47,311

Int. Cl. E21b *43/22*

U.S. Cl. 166—270 **62 Claims**



The disclosure is to secondary recovery and well stimulation, solutions, and methods of use. Primarily combinations of

sacrificial material capable of plating on formation surfaces and extending detergent action, are used together with at least one of a detergent, an emulsifier, and caustic as an emulsification activator, such use being conjointly with, or after the sacrificial material.

3,700,032

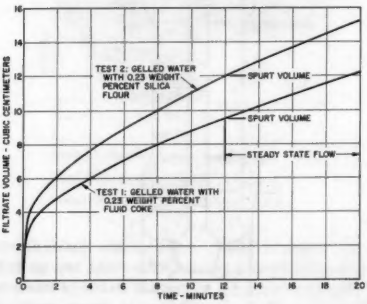
METHOD FOR FRACTURING SUBTERRANEAN FORMATIONS

William M. Terry, Houston; John W Graham, Alvin; Albert R. Sinclair, and Othar M. Kiel, both of Houston, all of Tex., assignors to Esso Production Research Company

Filed Dec. 16, 1970, Ser. No. 98,525

Int. Cl. E21b *43/26*

U.S. Cl. 166—283 **6 Claims**


FILTRATE VOLUME - CUBIC CENTIMETERS
TIME - MINUTES
TEST 2: GELLED WATER WITH 0.23 WEIGHT PERCENT SILICA FLOUR
SPURT VOLUME
SPURT VOLUME
STEADY STATE FLOW
TEST 1: GELLED WATER WITH 0.23 WEIGHT PERCENT FLUID COKE

A fracturing method wherein a fluid containing particles of petroleum coke are injected into a subterranean formation at a pressure sufficient to open a fracture therein.

3,700,033

HYDRAULIC SHOCK ABSORBER FOR LOOMS

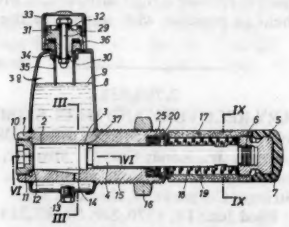
Jose Bosch, Aragon 376, Barcelona, Spain

Filed March 16, 1970, Ser. No. 19,726

Claims priority, application Spain, March 25, 1969, 765,708

Int. Cl. D03d *49/38, 49/54*

U.S. Cl. 139—161 **4 Claims**



A hydraulic shock absorber for looms, comprising a cylinder bearing body, an oil compression rod slidably disposed within the cylinder bearing body, an elastic cap mounted on one end of the rod and adapted to receive the impact of a shuttle, and an oil tank connected the cylinder bearing body. Communicating channel means are provided between the cylinder bearing body to the tank, and the cylinder bearing body comprising a hollow tubular element having an outer surface including a smooth portion, the oil tank being formed with an opening in which the smooth portion of the tubular element is inserted for connection to the oil tank, the outer surface of the tubular element including a threaded portion for adjustable mounting on the loom, and a connical end cap closing the hollow tubular element, the latter being formed with a substantially inner right-angle step in which the connical end cap engages.

3,700,034

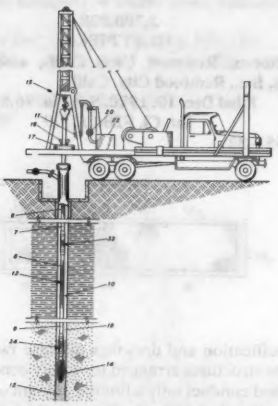
METHOD FOR WELL CLEANOUT

Stanley O. Hutchison, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 807,766, March 13, 1969, abandoned. This application March 11, 1971, Ser. No. 123,412

Int. Cl. E21b *21/00*

U.S. Cl. 166—312 **5 Claims**



A method of well cleanout by circulating preformed foam in a well through a segmented tubing string and the annulus between the tubing string and the well wall to remove sand and fluids from the well. Check valve means are placed in the segmented tubing string at preselected positions to maintain control over the foam in the well while foam injection is temporarily halted to permit addition of another tubular section to the tubing string. The check valve means insures that the foam in the well remains in a dynamic condition during such temporary halts so as to prevent sticking of the tubing string in the well.

3,700,035

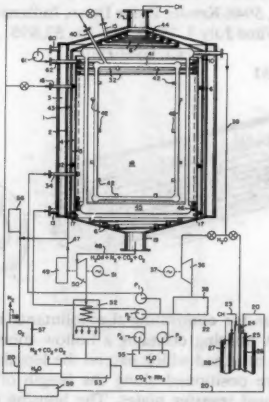
METHOD FOR CONTROLLABLE IN-SITU COMBUSTION

Hans Lange, Wietze, Germany, assignor to Deutsche Texaco Aktiengesellschaft

Filed June 4, 1970, Ser. No. 43,547

Int. Cl. E21b *43/24*

U.S. Cl. 166—261 **6 Claims**



A method and device for controllable in-situ combustion in subterranean hydrocarbon bearing formations containing

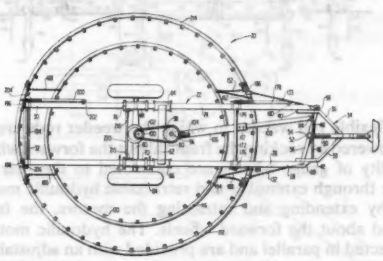
bitumens with simultaneous production and recovery of energy sources supplying the mechanical and thermal energy required for the in-situ combustion and operation of the facilities involved.

3,700,036

GROUND WHEEL DRIVEN OSCILLATING HARROW

August Reuber, 2790 Charlotte Street, Albany, Oreg.

Filed Aug. 7, 1970, Ser. No. 61,997
Int. Cl. A01b *39/10*
U.S. Cl. 172—105 **1 Claim**



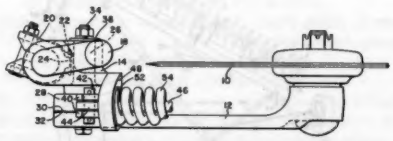
An agricultural implement in which spaced apart, concentric rings carry depending harrow points, the rings being subjected to oscillatory movement during operation by a pitman crank and sway bar actuated responsive to movement of the implement. The rings are adapted to folding to transport positions, and are also elevated for transport.

3,700,037

PLOW COLTER WITH YIELDABLE FORCE-APPLYING MEANS AND ADJUSTABLE OVERLOAD MOUNT FOR COLTER CARRYING ARM

Robert Dale Hentrich, Bettendorf, Iowa; Howard Christian Esbeck, Moline, and Loren Glenn Arnold, Rock Island, both of Ill., assignors to Deere & Company, Moline, Ill.

Filed Jan. 25, 1971, Ser. No. 109,304
Int. Cl. A01b *61/04*
U.S. Cl. 172—265 **8 Claims**



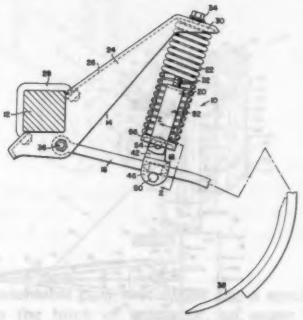
A colter arm having a colter on its rear end is connected to a rockshaft on a mounting bracket and is normally held in a working position by either a spring or a hydraulic cylinder acting between the mounting bracket and a lever arm on the rockshaft so that if the colter encounters an obstruction the spring or hydraulic cylinder will yield to permit the colter to move over the obstruction. The colter arm and one end of the rockshaft have complementary serrated faces which are clamped together to normally hold the colter arm and rockshaft in fixed relative positions. By loosening the bolt clamping the faces together the relative position of the colter arm with respect to the rockshaft can be varied, and, if the colter encounters an extra large obstruction, the bolt will stretch and permit the teeth of the serrated faces to slip and thereby prevent damage to the colter.

3,700,038

ADJUSTABLE SPRING TRIP SHANK ASSEMBLY

Duane Arnold Essex, Des Moines, Iowa, assignor to Deere & Company, Moline, Ill.

Filed March 3, 1971, Ser. No. 120,495
Int. Cl. A01b *61/04*
U.S. Cl. 172—265 **4 Claims**



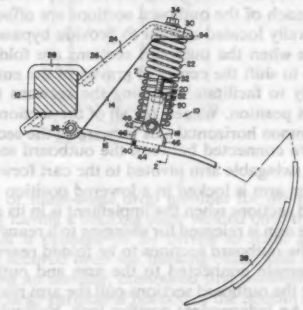
A self-restoring spring trip shank assembly of the type having a mounting element secured to a toolbar, a shank pivoted to the mounting element, and a spring acting between the mounting element and the shank to yieldably hold the shank in a working position. The spring acts on a multi-position reversible bracket secured to the shank so that by reversing the bracket the moment arm through which the spring force acts is varied and the force needed to pivot the shank upwardly is varied.

3,700,039

SPRING TRIP SHANK ASSEMBLY

Duane Arnold Essex, Des Moines; Virgil Dean Haverdink, Ankeny, and Donald Allan Hill, Des Moines, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed March 3, 1971, Ser. No. 120,496
Int. Cl. A01b *61/04*
U.S. Cl. 172—265 **6 Claims**



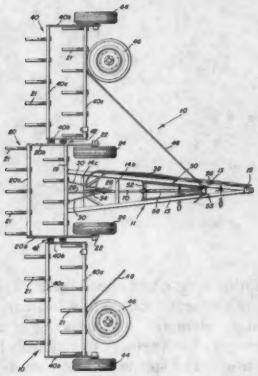
A self-restoring spring trip shank assembly in which the lever arm through which the spring acts to retain the shank in a working position decreases as the spring force increases upon upward deflection of the shank so that the force needed to trip the shank remains close to constant or has only a slight increase with increased tripping height.

3,700,040

FOLDABLE IMPLEMENT CART WITH FORWARDLY OFFSET WING SECTIONS AND TACKING MEANS FOR THE CABLE ARM RETAINING MEANS

Harry Sosalla; Lyle M. Meusburger, and Max L. Jarnagin, all of Sac City, Iowa, assignors to Noble Manufacturing Company

Filed June 30, 1970, Ser. No. 51,203
Int. Cl. A01b *65/02*
U.S. Cl. 172—311 4 Claims



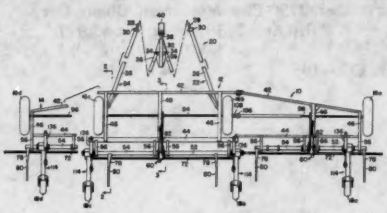
A foldable sectional tow-type implement, including a wheel cart having a centrally located section which is revolvably mounted on a horizontal axis extending transversely of the direction of travel for movement between a lower, generally horizontal, operative position and a generally vertical transport position, and a pair of outboard sections interconnected to the centrally located section and each being revolvable with the center section and also swingable in a fore and aft direction relative to the center section when revolved to the vertical transport position to permit folding of the outboard sections rearwardly relative to the center section. Each of the sections support or mount agricultural type tools. At least portions of each of the outboard sections are offset forwardly of the centrally located section to provide bypass clearance for the tools when the outboard sections are folded rearwardly and also to shift the center of gravity of the entire implement forwardly to facilitate revolving the sections to the vertical transport position. Wheels for all of the sections are mounted on a common horizontal axis forward of the sections. Flexible cables are connected between the outboard sections and the end of a swingable arm pivoted to the cart forward of the sections. The arm is locked in a lowered position to support the outboard sections when the implement is in its operative position. The arm is released for swinging to a rearward position to permit the outboard sections to be folded rearwardly, but the cables remain connected to the arm and outboard sections whereby the outboard sections pull the arm rearwardly during folding. An independent positive lock, hydraulically actuated when the outboard sections are lowered to their operative positions, is provided to lock the cable arm in its lowered position. The outboard sections are hingedly connected to the center section with a lost motion structure to provide for limited vertical movement of the outboard sections relative to the center section about the hinge connections to accommodate irregular terrain when the implement is moved thereover while in its folded transport position.

3,700,041

POSITION CONTROL FOR PARALLEL HYDRAULIC SYSTEMS ON AN AGRICULTURAL IMPLEMENT

Edward Clyde Ryan, 341 Eastlawn Drive, Ankeny, Iowa

Division of Ser. No. 812,577, March 28, 1969, Pat. No. 3,583,284. This application Oct. 23, 1970, Ser. No. 83,677
Int. Cl. A01b *63/14, 63/22*
U.S. Cl. 172—316 6 Claims



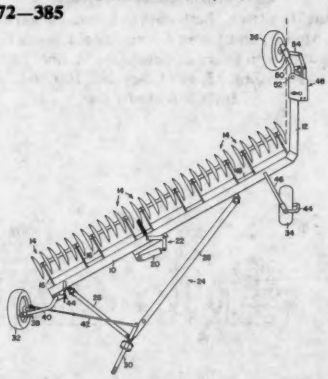
A flexible rod weeder in which the weeder rods are raised and lowered by rocking the frame about the forward wheels. A plurality of gauge wheels are connected to the rear of the frame through extensible and retractable hydraulic motors so that by extending and retracting the motors, the frame is rocked about the forward wheels. The hydraulic motors are connected in parallel and are provided with an adjustable stop which will prevent the lowering of the weeder rods beyond a predetermined position, but permit the flow of fluid from one motor to another so that the gauge wheels equally share the weight of the rear of the frame.

3,700,042

REAR FURROW WHEEL CONTROL STRUCTURE FOR DISC TILLERS AND THE LIKE

Roger Lee Patterson, Fonthill, and Mario Ventresca, Welland, Ontario, both of Canada, assignors to Deere & Company, Moline, Ill.

Filed Nov. 5, 1970, Ser. No. 87,186
Int. Cl. A01b *23/04, 15/14*
U.S. Cl. 172—385 16 Claims



Control structure for the rear furrow wheel of a disc tiller or the like including a first arm pivotally mounted on the rear portion of the frame and a second arm pivotally mounted medially on the rearward end of the first arm and rotatably supporting the furrow wheel on one of its ends. A pair of concentric link members are connected to the arms and are slidable through a trunnion structure on the frame as the furrow wheel moves from its operating to its turning and transport positions. Adjustable stops on each of the members are biased against the forward end of the trunnion by a spring and cable mechanism to normally maintain the furrow wheel in its operating position, the mechanism being yieldable to permit the wheel to swing to its turning and transport positions in

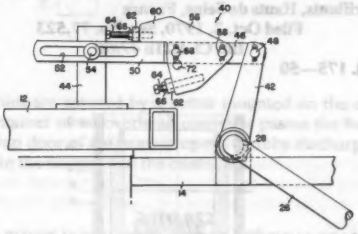
response to an abnormal side load on the wheel. A latch mechanism is provided to selectively lock the wheel in the latter position.

3,700,043

DEPTH CONTROL MEANS FOR A MOLDBOARD PLOW

James Franklin Sullivan, East Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed July 26, 1971, Ser. No. 166,018
Int. Cl. A01b *63/16*
U.S. Cl. 172—400 **15 Claims**



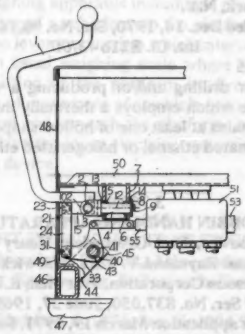
A pivoted stop member on a drawn plow prevents lowering movement of the plow frame on the front furrow wheel to a normal plowing position when in a first position and to a land-opening position below the normal plowing position when in a second position. Provision is also made to independently adjust the normal plowing position of the frame with respect to the front furrow wheel and the land-opening position of the frame with respect to the front furrow wheel.

3,700,044

HYDRAULIC SYSTEM FOR CONTROLLING BULLDOZER BLADE

David A. Berg, Milwaukee, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Sept. 21, 1970, Ser. No. 73,836
Int. Cl. E02f *3/76*
U.S. Cl. 172—804 **10 Claims**



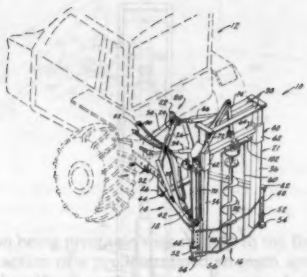
A single lever control valve means for controlling hydraulic actuators to pitch and tilt a bulldozer blade.

3,700,045

TRACTOR-MOUNTED POST HOLE DIGGER

John G. Coontz, P.O. Box 104, Kiowa, Kans.

Filed April 26, 1971, Ser. No. 137,237
Int. Cl. E21c *11/02*
U.S. Cl. 173—26 **6 Claims**



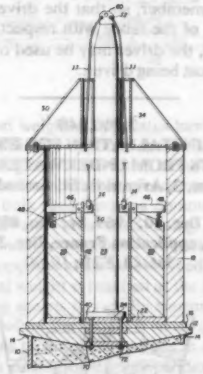
A tractor-mountable post hole digger has a special frame mountable on the hitch of a tractor, an auger specially mounted with the frame to be moved vertically relative the frame and rotated by the powering means of the tractor.

3,700,046

TWO-STAGE DROP HAMMER FOR DRIVING LARGE DIAMETER PILING

Robert G. Evans, P.O. Drawer 68, Harvey, La.

Filed March 8, 1971, Ser. No. 121,663
Int. Cl. E02d *7/00*
U.S. Cl. 173—103 **6 Claims**



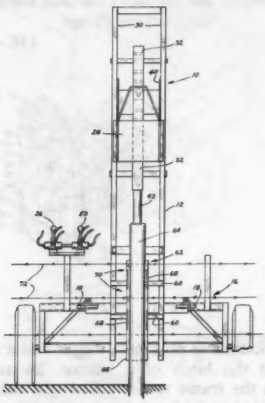
A two-stage or multi-stage drop hammer for driving large diameter piling having a backing plate welded onto the upper terminal end of a cylinder to be driven to form a pile, a hammer guide secured onto the backing plate, said hammer guide containing an annular, contoured first hammer for impacting upon a large peripheral portion of the bottom member of the hammer guide, and a second hammer for impacting upon a large central area of the bottom member of the hammer guide, and a flanged extension on the second hammer for lifting the first hammer to a distance above the bottom member of the hammer guide, whereupon dropping of the hammers provides and allows the first hammer to impact upon the bottom member of the hammer guide in timed sequence ahead of the second hammer impacting upon the bottom member of the hammer guide.

3,700,047

FENCE POST DRIVER

Michael A. Gartner, Route 1, P.O. Box 10, St. Anthony, N. Dak.

Filed May 11, 1971, Ser. No. 142,242
Int. Cl. E02d 7/00
U.S. Cl. 173—124 **6 Claims**



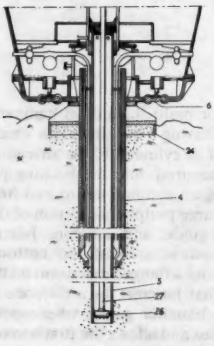
A fence post driver for driving fence posts, including replacement posts for an existing fence having a plurality of parallel strands, has a lifting mechanism which repeatedly elevates a hammer which when released, falls by gravity to hammer the fence post into the ground to the desired depth. The driver includes a post guiding member which is stationary with respect to the ground during the driving operation and formed with a vertically upstanding back portion and a pair of side portions secured to the back portion. Notches formed in the side portions align with the individual strands of the fence which are positioned between the post and the back portion of the post guiding member, so that the driver may operate on the opposite side of the fence with respect to the post being driven. Of course, the driver may be used on the same side of the fence as the post being driven.

3,700,048

DRILLING INSTALLATION FOR EXTRACTING PRODUCTS FROM UNDERWATER SEA BEDS

Robert Desmoulins, 3, Avenue de St. Amand, 59 Valenciennes, France

Filed Dec. 30, 1969, Ser. No. 889,357
Claims priority, application France, Dec. 31, 1968, 6819266
Int. Cl. E21c 19/00
U.S. Cl. 175—6 **10 Claims**



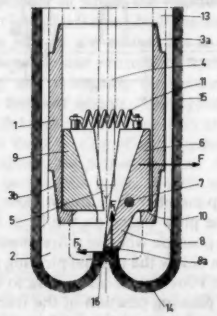
An installation for extracting products from underwater sea beds comprises a base section which is permanently sunk in the sea bed, a reusable well section, and water-tight flexible connecting means releasably connecting together the base section and well section. The well section has sufficient internal dimensions to allow workmen and equipment to pass therethrough and is open to the atmosphere so that the working space for the workmen is maintained at atmospheric pressure. The reusable well section may be disconnected from the base section and reused again at another extracting site.

3,700,049

DEVICE FOR CONNECTING A DRILL BIT TO A DRILL STRING PROVIDED WITH A PENETROMETER

Wladimir Tiraspolsky, Les Moulineaux; Roger Rouviere, Aix En Provence, and Yves Willm, Suresnes, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Hauts de Seine, France

Filed Oct. 2, 1970, Ser. No. 77,523
Int. Cl. E21b 47/00
U.S. Cl. 175—50 **7 Claims**



Device for connecting a drill bit having a central bore to a drill string having at its lower part a retractable penetrometer, comprising an obturation member for the central bore, the lower part of which is provided with cutting elements, and adapted to block said central bore in response to the centrifugal force generated by the rotation of the bit, said obturation member leaving open said bore in the absence of rotation of the bit.

3,700,050

METHOD FOR DRILLING AND COMPLETING A WELL AND A PACKER FLUID THEREFOR

Leon H. Miles, Plano, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Dec. 14, 1970, Ser. No. 98,163
Int. Cl. E21b 43/00
U.S. Cl. 175—65 **20 Claims**

A method for drilling and/or producing a well through a permafrost zone which employs a thermally insulated packer fluid which contains at least one of hollow shapes such as glass spheres, halogenated ethane, or halogenated ethylene.

3,700,051

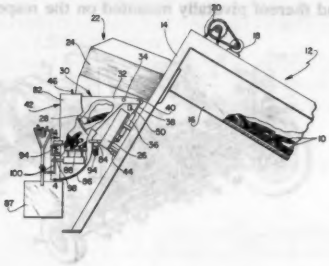
BOBBIN HANDLING APPARATUS

Charles W. Brouwer, East Greenwich; Henry C. Bucheister, Providence, and Raymond V. Tata, Warwick, all of R.I., assignors to Leesona Corporation, Warwick, R.I.

Division of Ser. No. 837,050, June 27, 1969, Pat. No. 3,593,896. This application March 19, 1971, Ser. No. 126,227
Int. Cl. G01g 13/18
U.S. Cl. 177—59 **10 Claims**

A bobbin handling apparatus in which filled bobbins are stored in a storage-conveyor bin and discharged through a chute and into a hopper. The bin continues to feed bobbins until a predetermined weight of bobbins is in the hopper

whereupon a control system stops operation of the bin and concurrently closes a closure associated with the chute to prevent any bobbins subsequently passing from the bin from entering the weighing hopper. Strands of yarn extending from



the bobbins are severed by a cutter mounted on the closure. As a container of an overhead conveyor passes the hopper a sliding trap door of the hopper opens thereby discharging the bobbins in the hopper into the container.

3,700,052

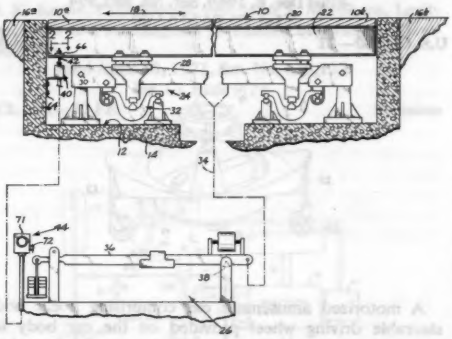
END SHIFT INDICATOR FOR PLATFORM SCALES

William C. Smith, P.O. Box 111, Kent, Oreg.

Filed Jan. 26, 1972, Ser. No. 220,919

Int. Cl. G01g *19/02*

U.S. Cl. 177—134 **5 Claims**



Vehicle weighing apparatus including a platform positioned to afford driving of a vehicle onto the platform. The platform is supported on lever mechanism which interconnects the platform with the usual weighing scale where vehicle weight is measured. Shifting of the platform in directions extending along the path of movement of a vehicle onto the platform displaces a control rod beneath the platform, and any such displacement is detected by an electrical detecting means including a signaling device.

3,700,053

WEIGHT-INDICATING TRAILER COUPLER

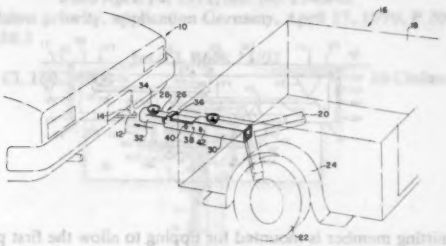
Wilmer E. Glissendorf, Phoenix, Ariz., assignor to Advanced Management Engineering & Research Company, Phoenix, Ariz.

Filed Dec. 6, 1971, Ser. No. 204,967

Int. Cl. G01g *3/08, 19/08, 23/14*

U.S. Cl. 177—136 **9 Claims**

A weight-indicating trailer coupler for visually indicating actual tongue weight or tongue load of a trailer which is applied to a tow car hitch, during loading, after loading, or after rearranging a load, for the purpose of insuring safe towing through application of adequate weight on the tongue and tow car hitch ball. Actual tongue weight may be read off of a calibrated scale. The coupler consists of two pivotally engaged portions, one of which is attached to a trailer tongue, and the



other portion being pivotable with respect to the first portion, against the action of a predetermined strength spring means interposed therebetween, to indicate tongue load visually on a scale.

3,700,054

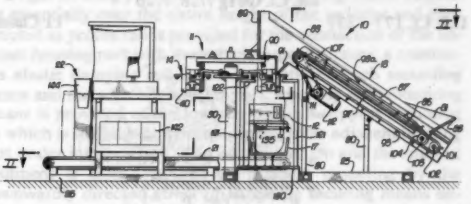
TWO STATION RECEPTACLE AND WEIGHING APPARATUS

Stanley A. McClusky, 3001 Baylor Avenue, Bakersfield, Calif.

Filed Sept. 13, 1971, Ser. No. 179,761

Int. Cl. G01g *21/10*

U.S. Cl. 177—184 **9 Claims**



A bag filling and weighing apparatus having a bag applying station and diametrically opposite thereto a single combined filling and weighting station at which simultaneous feeding of articles by both bulk and dribble feed methods is provided, both dribble and bulk feed having a common discharge zone and both dribble and bulk feed being operable until a preselected underweight condition is reached at which time the bulk feed is stopped and the dribble feed continues feeding until a precise final weight is reached at the single station. The apparatus includes means to rapidly transmit weight of each article to a scale before the article is received in a bag or box, and includes means to impart vibrations in a horizontal plane to the bag or box during filling independently of the weight sensing by the scale.

3,700,055

THRESHOLD RESPONSIVE SCALE

Jean-Claude Gaulier, Bois D'Arcy, France, assignor to Compteurs-Schlumberger, Montrouge, France

Filed Feb. 10, 1972, Ser. No. 225,212

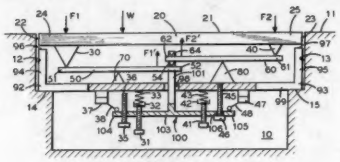
Claims priority, application France, Feb. 12, 1971, 7104781

Int. Cl. G01g *3/04, 19/46, 21/16*

U.S. Cl. 177—204 **9 Claims**

According to an illustrative embodiment of the invention, a scale for passageway is described comprising a horizontal plate for mounting level to the floor of the passageway to receive loads moving therein. Means are provided to convert the vertical load on the plate into a force on a force transmitting member having a first and a second portion subjected

by virtue of respective first and second prestressed springs to forces which resist displacement of these portions when a force is applied to the force transmitting member by the load converting means. The second spring is prestressed with a force greater than that of the first spring and the force transmitting member is mounted for tipping to allow the first portion to be displacing the second portion against the second spring. Means responsive to the displacements of the first and second portion are provided for detecting respective first and second load thresholds on the plate and adapted for coupling to control means of the passageway.



3,700,056

TOP LOADING PRECISION BALANCE HAVING ANNULAR WEIGHTS

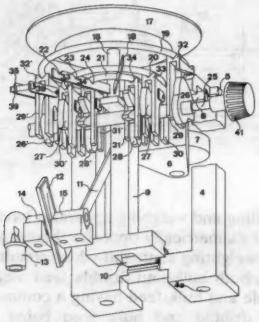
Hans Bucumann, Oetwil, Switzerland, assignor to Mettler Instrumente A.G., Greifensee-Zurich, Switzerland

Filed Aug. 12, 1971, Ser. No. 171,093

Claims priority, application Switzerland, Aug. 26, 1970, 12766/70

Int. Cl. G01g *1/28, 1/26*

U.S. Cl. 177—237 **11 Claims**



A top loading precision balance having a weighing pan held horizontal by a parallelogram linkage is provided with a set of coaxial, annular weights mounted on the stem of the pan above the secondary or suspension pivot which connects the balance beam with a vertical pan carrier member of the linkage. The weights may be lifted from the stem of the pan in any desired combination by means of lifters operated by cams on a single control shaft, but remain coaxial in all positions, their common axis passing through the center of the pan and being laterally offset from the upright pan carrier, which is parallel to a stationary support member in the parallelogram linkage.

3,700,057

FOLDABLE TRANSPORTATION DEVICE

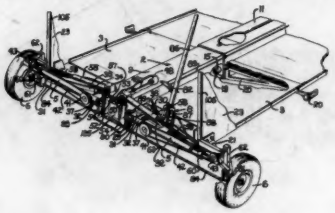
Loyce M. Boyd, 11400 Longview Road, Jackson County, Mo., and Clarence L. Boyd, 1100 County Line Road, Bldg. 7, Apt. 4, Wyandotte County, Kans.

Filed May 3, 1971, Ser. No. 139,619

Int. Cl. B62d *63/02*

U.S. Cl. 180—1 R **10 Claims**

A foldable transportation device having the component parts thereof movable between a folded storage position and an extended in-use position for travel is disclosed and includes a center frame having a plurality of telescopeable sections and a body including floor and end and side wall members mounted thereon and movable therewith between respective folded positions and extended in-use positions and a pair of opposed arms for each end of the center frame each having one end thereof pivotally mounted on the respective side of the center frame and each having a wheel rotatably mounted on the other end thereof with each arm being movable between a folded storage position and an in-use position for movably supporting the transportation device. Drive means and steering means are operatively connected to selected wheels for controlling movement and travel of the transportation device.



3,700,058

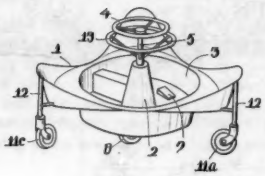
MOTORIZED AMUSEMENT CAR

Ayako Kuwahara, Tokyo, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Dec. 8, 1969, Ser. No. 882,994

Int. Cl. B62d *61/00*

U.S. Cl. 180—21 **2 Claims**



A motorized amusement car comprising a car body, a steerable driving wheel provided on the car body to be steered, a group of three or more caster wheels positioned near the outer edge of the car body and surrounding the driving wheel and a substantially annular seat surrounding the steering mechanism of the driving wheel, the driving wheel extending below the imaginary plane including all of the caster wheels, i.e., the plane upon which the caster wheels would rest if there were no driving wheel, so that the motorcar is not only capable of being driven in any desired direction by manually operating the steering mechanism but is also capable of changing its direction of movement in response to changes in the manner in which the weight of the person riding thereon is distributed.

3,700,059

TANDEM WHEELED VEHICLE WITH STABILIZING APPARATUS

Denver Sutton, R.R. #2, Angola, Ind.

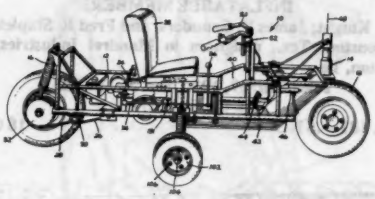
Filed June 11, 1971, Ser. No. 152,283

Int. Cl. B62d *61/12*

U.S. Cl. 180—30 **14 Claims**

A motor vehicle having wheels arranged in tandem along the longitudinal axis of the vehicle, and which includes a steering mechanism and a supporting frame. The vehicle is provided with a pair of wheels disposed in bilaterally symmetrical

spaced-apart relationship to the longitudinal axis of the vehicle and strut means securing the wheels to the vehicle for verticle-swinging movement between retracted and extended positions. There are means coupled between the wheels and the steering mechanism of the vehicle for steering the wheels



in synchronism with the vehicle's steering mechanism in all positions of the wheels between their retracted and extended positions. There are also provided motor means for moving the wheels between their retracted and extended positions, and switch means for selectively operating the motor means to retract and extend the wheels.

3,700,060

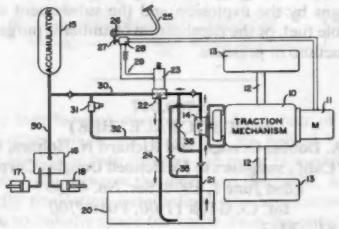
TRACTION MECHANISM ACTUATED PRESSURE SOURCE

Derek K. Keene, Philadelphia, and John J. McElhare, Levittown, both of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed April 30, 1971, Ser. No. 139,122

Int. Cl. B66f *9/14*

U.S. Cl. 180—53 FE **9 Claims**



In a vehicle such as an industrial truck, the traction mechanism operates a pump to charge an accumulator. When the traction mechanism is power actuated to propel the truck, the fluid moving through the pump is directed through a pressure free circuit in bypass relation to the accumulator so that the pump requires very little power. When power to the traction mechanism is withdrawn, as when the vehicle is coasting, the bypass circuit for the fluid moving through the pump is closed, and the fluid is directed to the accumulator to be charged. This charging of the accumulator acts to brake the traction mechanism, so that beneficial braking of the vehicle is contributed at the same time that the accumulator is charged. If, at any time, the accumulator does not have sufficient charge when a particular pressure operated device is to be operated, the circuit of an electric motor driving an auxiliary pump is actuated automatically so as to bring about the operation of the pressure operated device.

3,700,061

ELASTIC MOUNTING OF A RADIATOR OF MOTOR VEHICLES

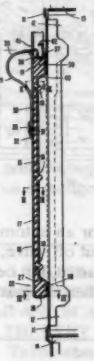
Franz Hortnagl, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertuerkheim, Germany

Filed April 16, 1971, Ser. No. 134,642

Claims priority, application Germany, April 17, 1970, P 20 18 458.1

Int. Cl. B60k *11/02*

U.S. Cl. 180—68 R **18 Claims**



An elastic mounting of a radiator in a motor vehicle in which the two lateral walls of the radiator block are reinforced by a rigid housing part and one rigid mounting means extending essentially over the entire height of the radiator and constructed as profile rail is provided for the connection of the adjacent housing part with the vehicle superstructure; a continuous elastic damping rail is inserted between each mounting means and the adjacent housing part, whereby each mounting means is provided at the lower end with a support mounting on which is seated a support abutment of the adjacent housing part under interposition of an elastic cushion and the support abutment is forced against the support mounting by the downwardly directed effect of an elastic securing means engaging in the upper area of the housing part, and whereby each housing part is provided additionally with an upper support mounting on which is supported the clamping arm portion of a spring clip anchored to the mounting means by another arm portion.

3,700,062

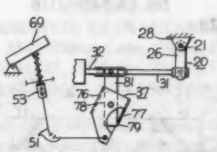
NEUTRAL DEVICE FOR INTERNAL COMBUSTION ENGINE POWERED TRUCKS

Donald Garnett, Homewood, Ill., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 10, 1970, Ser. No. 96,886

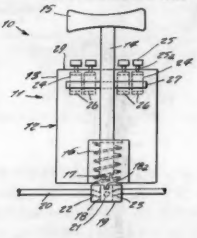
Int. Cl. B60k *23/00*; B60r *21/00*

U.S. Cl. 180—101 **4 Claims**



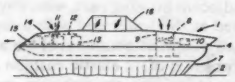
The vehicle transmission is automatically placed in a neutral condition at the time the operator's seat is vacated. This is achieved by a seat actuated mechanism including a cable operated control structure which moves a reciprocating element of the shift control linkage to neutral from either of its forward and neutral positions when the vacated seat is shifted upwardly by spring means.

3,700,063
FUEL LOCK
Edward Dunseath, 51 Jefferson Blvd., Port Jefferson Station, N.Y.
Filed Nov. 16, 1970, Ser. No. 89,707
Int. Cl. B60r 25/00
U.S. Cl. 180—114 2 Claims



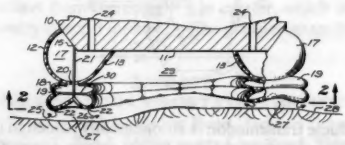
An anti-theft device for an automotive vehicle, the device comprising a gasoline shut off valve; the valve not preventing the engine from being started, but being able to cause the engine to come to a stop when the gasoline supply in the carburator is used up.

3,700,064
GAS-CUSHION VEHICLE
Harold Richardson, and Bruce D. Newman, both of Lachine, Quebec, Canada, assignors to Hovermarine (Canada) Limited, Lachine, Quebec, Canada
Filed June 15, 1970, Ser. No. 46,238
Int. Cl. B60v 1/00
U.S. Cl. 180—119 3 Claims



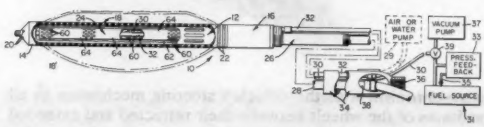
A gas-cushion vehicle is provided with steering means comprising steering members adapted to be brought into contact with the surface over which the vehicle travels and disposed on each side of the fore and aft axis of the vehicle so as to apply steering forces differentially to the vehicle and means for biasing the steering members away from said surface.

3,700,065
FLUID CUSHION CELLS FOR FLUID CUSHION VEHICLES
Wilfred J. Eggington, Claremont, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.
Continuation of Ser. No. 802,620, Feb. 26, 1969, abandoned.
This application Aug. 30, 1971, Ser. No. 176,212
Int. Cl. B60v 1/16
U.S. Cl. 180—128 6 Claims



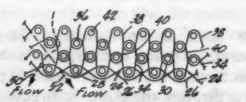
According to the present disclosure, a deformable chamber is provided beneath the rigid body of a fluid cushion vehicle. A plurality of expansible chambers are mounted to the deformable chamber and in fluid communication therewith. Orifice means provides fluid communication between each expansible chamber and a region below it to form a fluid cushion cell. According to one feature of the present disclosure, the deformable chamber is confined to a region below the periphery of the body so as to define another cushion cell within its bounds.

3,700,066
GAS OPERATED SEISMIC SOURCE EMPLOYING AN INFLATABLE MEMBER
Paul A. Knight; James R. Saunders, and Fred E. Stapleton, all of Houston, Tex., assignors to Mandrel Industries, Inc., Houston, Tex.
Filed Feb. 27, 1970, Ser. No. 14,923
Int. Cl. G01v 1/14
U.S. Cl. 181—.5 NC 18 Claims



A gas operated seismic source has a rigid elongated cylindrical form and includes at least a single, hollow, thick wall barrel along most of the central length thereof, wherein the internal volume defines therein a combustion chamber. The barrel has a plurality of perforations formed along its length of a selected number, size or sizes, and arrangement. An inflatable member is secured at either end thereof about the perforated barrel to enclose the perforations and define accordingly an expandable outer wall about the combustion chamber. The perforated barrel has a substantially constant diameter as does the inflatable member, and the barrel supports the inflatable member when in its collapsed state. Thus the outside dimensions of the entire length of the source are substantially constant to allow the source to be readily forced or "planted" into and also retrieved from a consolidated or an unconsolidated formation, or to readily allow inserting the source into a predrilled hole in a consolidated formation. Means are provided to introduce a preselected mixture of combustible fuel into the combustion chamber. Upon firing, the burned gases are forced out an exhaust means by the explosion and the subsequent charge of combustible fuel, or the combustion chamber is purged by employing vacuum or pressure.

3,700,067
ACOUSTIC FACE SHEET
Richard A. Dobbs, Orange, and Richard N. Holmes, Glendale, both of Calif., assignors to McDonnell Douglas Corporation
Filed June 1, 1970, Ser. No. 41,897
Int. Cl. G10k 11/00; F01n 7/00
U.S. Cl. 181—33 G 2 Claims

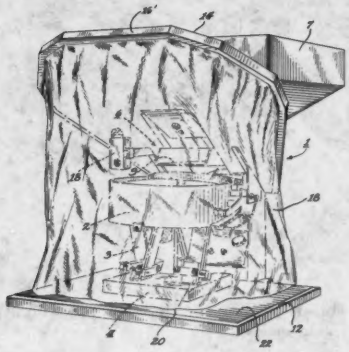


A three-dimensional acoustic porous face sheet formed from an integrally woven fabric and made rigid in a desired configuration by a resin system.

3,700,068
NOISE REDUCTION CANOPY DEVICE FOR MACHINERY
Theodore R. Francis, 855 Richard Street, Aurora, Ill.
Filed Jan. 5, 1972, Ser. No. 215,510
Int. Cl. F02f 7/00; F01n 1/10
U.S. Cl. 181—33 K 5 Claims

Sound reduction apparatus for use with a machine, which apparatus includes a rigid sound-absorbing canopy overlying

the noise-producing portions of the machine and a curtain formed of flexible light-transmissive, sound-restricting sheet plastic material extending downwardly from the canopy and



enclosing the noise-producing portions of the machine with the bottom of the curtain in free-resting relationship upon a surface.

3,700,069

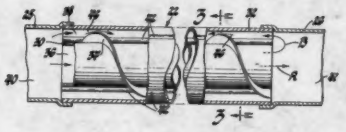
WAVE INTERFERENCE SILENCER

John T. Rausch, and William J. Parker, both of Flint, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 20, 1971, Ser. No. 145,405

Int. Cl. F01n *1/12, 7/08*

U.S. Cl. 181—36 B **5 Claims**



A wave interference silencer includes a pair of coaxially disposed pipes which are separated by helical baffle and define an axial flow path through the inner pipe and an outer helical flow path between the pipes and the baffle. A plurality of inwardly projecting longitudinal ribs are formed on the outer pipe to radially space the baffle from the outer pipe and define a plurality of frequency independent annular acoustical and fluid leakage paths between adjacent turns of helical flow paths. The leakage paths provide parallel acoustical couplings which are effective upon increasing frequency to attenuate acoustical energy in the helical flow path thereby producing a reduced acoustical pressure at the exit end of the silencer such as the portion of the acoustical energy from the inner pipe reversely flows through the leakage paths for additional attenuation.

3,700,070

SCISSORS-TYPE LINKAGE

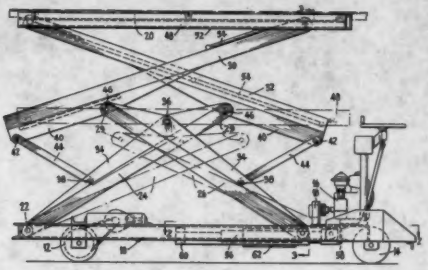
John Calaby King, North Balwyn, Victoria, Australia, assignor to Concrete Formwork Engineers Pty. Ltd., Northcote, Victoria, Australia

Filed July 21, 1971, Ser. No. 164,756

Int. Cl. E04g *1/22*

U.S. Cl. 182—16 **7 Claims**

The invention relates to a scissors-type linkage mechanism for raising and lowering working platforms. The invention overcomes the prior art disadvantage of high initial raising force by providing a mechanism in which, in the fully collapsed position, the pivot point between the two lowest links is substantially above the line of action of a horizontally acting hydraulic cylinder.



3,700,071

METHOD OF ERECTING SUSPENDED SCAFFOLDING AT CONSTRUCTION FIELD AND SCAFFOLDING ERECTED THEREBY

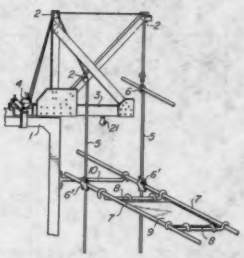
Reizo Kikuchi, 73 Aza Takamatsu, Haranomachiodawara, Sendai, Japan

Filed Sept. 17, 1971, Ser. No. 181,340

Claims priority, application Japan, July 3, 1971, 46/50840; July 3, 1971, 46/58202; July 3, 1971, 46/58203

Int. Cl. E04g *3/10*

U.S. Cl. 182—150 **2 Claims**



A suspended scaffolding used at the construction field of a multistoried building. The scaffolding can be easily erected and disassembled due to the simple combination of wire ropes and horizontal and lateral rods. The scaffolding does not occupy a large space for erection and the vertical distance between the horizontal rods can be easily varied.

3,700,072

SAWHORSE WITH RETRACTABLE LEGS

Maxwell J. Lovett, 3511 Hilltop Lane, Cocoa, Fla.

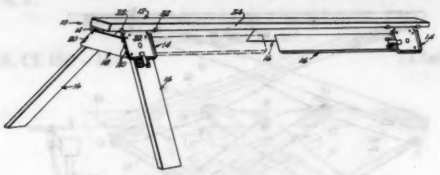
Filed Oct. 23, 1970, Ser. No. 83,322

Int. Cl. E04g *1/32;* **F16m** *11/00*

U.S. Cl. 182—155 **6 Claims**

A sawhorse structure comprising a transverse work support member and a pair of legs normally diverging downwardly and outwardly from each end portion of the transverse member, the pairs of legs being adapted to be retracted from the diverging positions in a manner so as to reduce the necessary storage or transportation space of an average size saw horse from approximately 10 cubic feet to approximately 1¼ cubic feet. The mechanism for retracting the legs includes a pair of interconnected brackets fixed to each end portion of the transverse member, and pivots connecting one leg to each bracket, a unique application of a pair of yokes associated with each

bracket whereby each leg is maintained in either the extended or the retracted position by the pivots and three legs of the



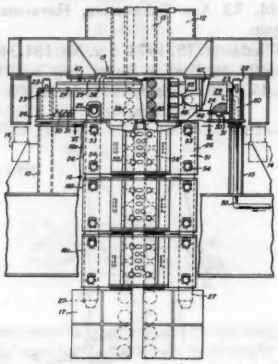
pair of yokes, a latch mechanism being employed to lock each leg in either of the retracted or extended positions.

3,700,073

SELF-ALIGNING AND FLEXING GUIDE-ROLL RACK

Charles H. Bode, Jr., Upper St. Clair Township, Allegheny County, Pa., assignor to United States Steel Corporation

Filed May 13, 1971, Ser. No. 143,077
Int. Cl. B65g *13/00*
U.S. Cl. 193—35 8 Claims



A guide-roll rack for use in a continuous-casting machine. The rack is formed of a short-length upper section and a longer lower section which is made up of individual subsections. Both the upper and lower sections are supported on a frame which rests on the supporting structure of the machine. The rack is stationary vertically but can shift horizontally to a limited extent to facilitate aligning it with the mold and its sections and subsections with one another. The mold-support frame oscillates vertically, but carries rollers which ride against the upper section of the rack for aligning the rack with the mold. The sections and subsections are flexibly connected to assure proper alignment.

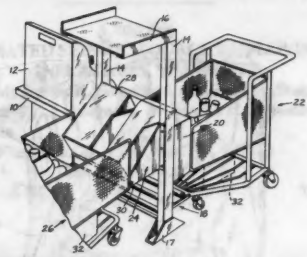
3,700,074

CHECK OUT SYSTEM

Willie M. Shoffner, 318 South Luthern Church Road, New Lebanon, Ohio

Filed Aug. 11, 1970, Ser. No. 62,889
Int. Cl. E04h *3/04*
U.S. Cl. 186—1 AC 8 Claims

The specification discloses a merchandise check out system in which a cart in which the customer has collected the merchandise is presented to a check out station so that a check out clerk in the station can pick up the articles of merchandise from the cart directly, while a second cart in end to end relation with the first cart has bags therein into which the merchandise can be placed directly by the check out clerk, thereby eliminating the counters and conveyors. The basket of



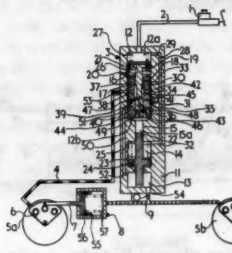
the cart is open at the front and is tiltable upwardly at the front end to selected angles.

3,700,075

BRAKING SYSTEMS

Frank R. Mortimer; Alan R. Brewster, both of Coventry, and Michael J. Bartram, Nuneaton, all of England, assignors to The Dunlop Company Limited, Birmingham, England

Filed Sept. 25, 1970, Ser. No. 75,547
Claims priority, application Great Britain, Sept. 27, 1969, 47,630/69
Int. Cl. B60t *13/10*
U.S. Cl. 188—346 17 Claims



A self-servo device for a fluid pressure operated braking system and utilizing torque reaction developed by the brake and transmitted as fluid pressure by a torque sensing unit sensitive to the braking torque reaction to amplify the fluid pressure supplied from the device to the brake, the device preventing an unlimited rise in the fluid pressure supplied to the brake so as to maintain a substantially constant torque reaction, a fluid flow damping unit being fitted to a movable member of the self-servo device.

3,700,076

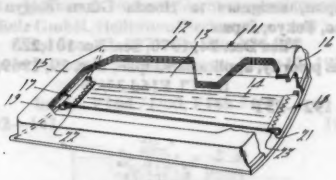
SIDE PROTECTION DEVICE FOR MOTOR VEHICLES

Bernard Forsting, Rheydt; Edmund Hellriegel, Cologne, and Dieter Pfadenhauer, Pulheim, all of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 16, 1970, Ser. No. 81,351
Claims priority, application Germany, Nov. 29, 1969, P 19 59 989.4
Int. Cl. F16f *7/12*
U.S. Cl. 188—1 C 6 Claims

Side impact protection for motor vehicle bodies, particularly for the doors of the passenger compartment to restrict

the depth of penetration of an impacting vehicle. A band-shaped energy absorbing element is arranged contiguous to



the inner surface of an outer door panel and is anchored on the door end walls.

3,700,077

CHOCK FOR A TANDEM WHEELED TRAILER

Abraham Harder, 6230 Lewis Avenue, Long Beach, Calif.

Filed July 13, 1971, Ser. No. 162,154

Int. Cl. B60t *3/00*

U.S. Cl. 188—32 **4 Claims**

This invention relates to a means of holding the wheels of a trailer or the like against accidental rolling or movement. The spaced hollow tubes engage aligned wheels of the trailer and are pressed tightly against these wheels by means of an off-center coupling which is extended by pressing downwardly against the hinged portion of the coupling.

3,700,078

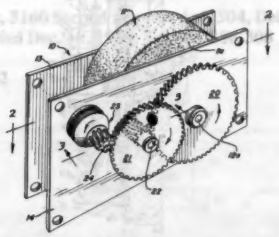
SPEED RETARDING DEVICE

Nicholas J. Froio, Harvey, Ill., assignor to Froio Corporation, Harvey, Ill.

Filed Nov. 23, 1970, Ser. No. 91,935

Int. Cl. B60t *8/00*; **B65g** *13/00*

U.S. Cl. 188—180 **1 Claim**



This device for retarding the movement of an object includes a rotatable member mounted for axial adjustment and biased to assume a predetermined axial position. The rotation of the member is responsive to the movement of the object being retarded. The rotatable member is provided with means for imparting an end thrust to the member upon rotation thereof, thereby causing the member to move from the predetermined axial position. The rotatable member carries one section of a sectional braking unit, and the one section is adapted to frictionally engage a stationary second section of the braking unit upon a predetermined thrust being applied to the member.

3,700,079

AUTOMATIC TRANSMISSION EFFECTIVE FOR CHANGING SPEED BY BRAKE PRESSURE

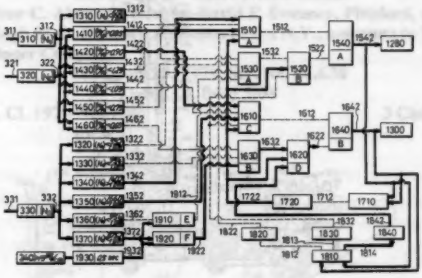
Takeaki Shirai, Nagoya; Shigeru Sakakibara, Okada; Masaaki Noguchi, Nagoya, and Masaharu Sumiyoshi, Toyota, all of Japan, assignors to Nippon Denso Kabushiki Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha

Filed May 14, 1970, Ser. No. 37,150

Claims priority, application Japan, May 24, 1969, 44/40291

Int. Cl. F16h *57/10*; **B60k** *29/02*

U.S. Cl. 192—4 A **6 Claims**



The automatic transmission system incorporates a hydraulic torque converter (which with its associated torque activated elements is hereinafter referred to as torcon). The aforesaid associated mechanisms or elements comprising a hydraulic torque converter pump, a hydraulic torque turbine, an associated multiple gear assembly, a friction engaging means for activating the appropriate elements of the speed change gearing of the multiple gear assembly and an oil pressure operation circuit, the same being effectuated by a signal generated by a brake pressure detector, the aforesaid mechanisms, assemblies and oil pressure operation circuit being activated electrically, or mechanically.

3,700,080

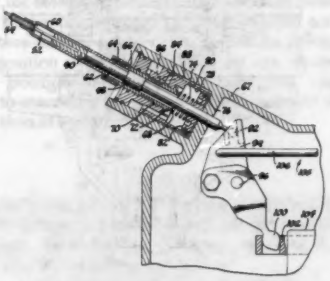
TRANSMISSION WITH FLUID PRESSURE RELEASED BRAKE

John Z. Delorean, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 25, 1971, Ser. No. 174,724

Int. Cl. F16d *67/00*; **B60k** *29/02*

U.S. Cl. 192—4 A **5 Claims**

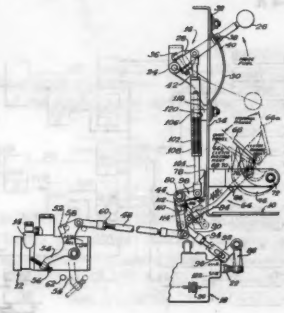


The parking brake mechanism illustrated includes a cable-actuating arrangement wherein the removal of the Park pawl from the teeth of a transmission output shaft, under load conditions, is hydraulically assisted by a piston and valve arrangement which is actuated by the reaction to cable movement or an arcuately positioned cable sheath having one end fixed on the pushbutton housing and the other movable end connected to the valve body.

3,700,081
TRACTOR INCHING CONTROL UTILIZING A DECELERATOR

Robert B. Porter, Melrose Park; Clarence A. Ardelt, Wheaton, and Robert C. Storck, Glen Ellyn, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 26, 1971, Ser. No. 109,870
Int. Cl. B60k *29/00*
U.S. Cl. 192—.07 7 Claims

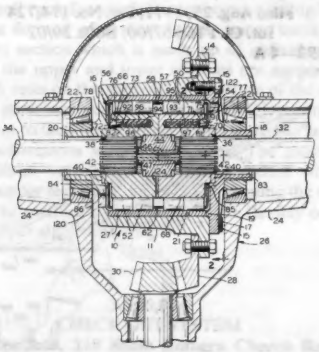


Inching mechanism for accurately controlling final movement of a loader toward the body of a truck being loaded thereby. A separately provided decelerator pedal coordinates neutralization of the customarily provided transmission and deceleration of the customary engine for vehicle inching purposes, all without disturbing settings of such customarily provided gear selector and clutch operator and fuel control.

3,700,082
DIFFERENTIAL DRIVE MECHANISM

Delmar G. Schwab, Portland, Oreg., assignor to Hy-Torq Corporation, Portland, Oreg.

Continuation of Ser. No. 758,988, Sept. 11, 1968, abandoned.
This application July 9, 1970, Ser. No. 56,171
Int. Cl. F16d *41/06*
U.S. Cl. 192—50 12 Claims

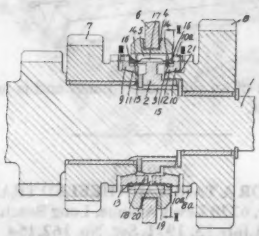


A differential drive mechanism includes a driven body assembly adapted to drive or permit overrunning of either of two hubs through crowned rollers movable by cup-shaped cages having bottoms frictionally engaging damping bosses of an end cap and an inner flange of an integral body and also engaging friction actuating plugs carried by the hubs. Limited lost motion is provided between the hubs to permit one to be driven while the other overruns.

3,700,083
SYNCHROMESH TRANSMISSION APPARATUS

Noboru Ashikawa, Kawagoe, and Fujiya Maruno, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1970, Ser. No. 101,223
Claims priority, application Japan, Dec. 29, 1969, 45/1218
Int. Cl. F16d *23/06*
U.S. Cl. 192—53 F 10 Claims

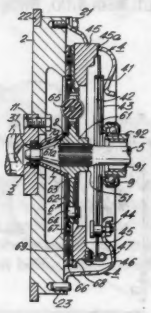


A synchromesh transmission comprises a resilient ring interposed between a sleeve mounted for axial slidable movement on a hub on a main shaft and a blocking ring provided on the outside of the sleeve. The resilient ring is arranged so that at the time of displacement of the sleeve, the resilient ring is initially pushed laterally by the sleeve so as to push the blocking ring and then the resilient ring is compressed and deflected radially by the sleeve so as to allow the sleeve to pass thereover and engage a drive gear loosely mounted on the main shaft.

3,700,084
FRICTION DISC CLUTCH FOR VEHICLES

Jiro Nasu, Nagoya; Tokuo Ogawa, Niwa-gun, and Yoshio Sekine, Ama-gun, all of Japan, assignors to Toyota Jidosha Hanbai Kabushiki Kaisha, Aichi-ken, Japan

Filed July 13, 1971, Ser. No. 162,059
Claims priority, application Japan, July 13, 1970, 45/69822; July 31, 1970, 45/77011; Aug. 29, 1970, 45/75717; Dec. 28, 1970, 45/137524
Int. Cl. F16d *13/50*
U.S. Cl. 192—70.28 25 Claims

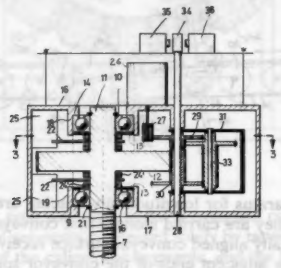


A friction disc clutch of the type which includes an output shaft, a flywheel secured to a drive shaft, a clutch cover connected to the flywheel, a pressure plate mounted movably in the clutch cover, a dish spring supported by the clutch cover and the pressure plate, and a clutch disc mounted slidably on the output shaft and positioned between the flywheel and the pressure plate. Means for causing additional thrusting force to disengage the clutch disc forcefully from the flywheel in disengaging operation of the clutch is provided between an inner race of a guide bearing receiving the top end of the output shaft and the clutch disc, thereby to expedite disengaging operation.

3,700,085
MOTOR DRIVEN POSITIONING APPARATUS WITH FORCE-CONTROLLED SHUTOFF SWITCHES

Jurgen Balz, Heilbronn Neckar, Germany, assignor to Firma Helmut Balz GmbH, Heilbronn/Neckar, Germany

Filed Jan. 13, 1971, Ser. No. 106,030
Claims priority, application Germany, Sept. 12, 1970, P 20 45 249.7
Int. Cl. F16d *71/00*; F16k *31/04*
U.S. Cl. 192—141 10 Claims



A drive gear is driven by a motor, the gear positioning the positioned member, such as a valve stem, with predetermined force against an obstruction, such as a valve seat. A torque sensing means is provided sensing excess torque applied by the motor to the gear to disconnect the motor. In the disclosed embodiment, the torque sensing element includes a cage swingable over a shaft and carrying, offset with respect to the shaft, a gear transmitting drive power from the motor to the positioned gear. The cage is restrained from swinging about the shaft by a spring; if the torque transmitted exceeds the restraining spring force, the cage will deflect, deflecting movement causing shut-off of the motor. To end-position the valve stem, spring-controlled frictional force is applied to the drive gear when a terminal position is reached causing axial excursion of the drive gear relative to its housing.

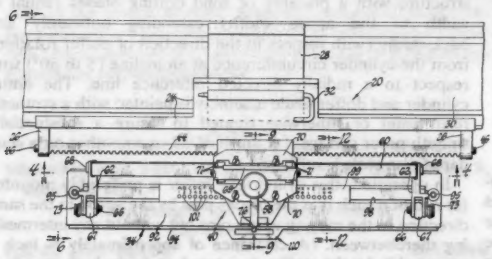
ERRATUM

For Class 193—35 see:
Patent No. 3,700,073

3,700,086
TYPEWRITER FOR USE WITH A DRAFTING STRAIGHT EDGE

David P. Jones, 3160 Second Avenue, Apt. 504, Detroit, Mich.

Filed Dec. 18, 1969, Ser. No. 886,308
Int. Cl. B41j *3/38*
U.S. Cl. 197—2 15 Claims

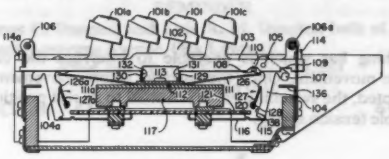


A printing assembly including a support means supporting a rack and adapted to be attached to a drafting straight edge. The rack extends through a head assembly and is engaged by a pinion gear for moving the head assembly along the rack. The head assembly is connected through links to a carriage which supports two longitudinally extending rows of type characters. The head means is moved between a raised position and a lowered position and includes a hammer pin for engaging one of the type characters to cause it to print when in the lowered position. Normally the head means prints the characters in one row but includes a handle on the links interconnecting the head means and the carriage to shift the position of the links so that upon movement of the head means to the lowered position, a character in the other row will be printed.

3,700,087
PAWL ACTUATOR AND LOCKING MECHANISM FOR IMPACT CONTACT KEYBOARD

Wilbur C. Ahrns, Rochester; David F. Sweeney, Pittsford, and Hugh St. L. Dannatt, Rochester, all of N.Y., assignors to The Singer Company

Filed July 27, 1970, Ser. No. 58,638
Int. Cl. B41j *5/08*
U.S. Cl. 197—98 3 Claims



A keyboard is disclosed which produces a signal in response to the depression of a selected key lever. In response to the depression of the selected key lever, a resilient spring contact is deflected away from a relatively fixed contact and released. The resilience of the resilient spring contact causes said spring contact to return towards the relatively fixed contact and make a momentary closure therewith. In response to the momentary closure, an electrical signal is produced during the charge time of a capacitor in series with the closing contacts. The capacitor is so chosen that it will be substantially fully charged in response to the closure of the contacts and no additional signal will result in the event that there should be any contact bounce or multiple closures thereof. An actuating pawl for actuating the resilient contact spring is attached to the key lever and a single spring is used to bias the actuating pawl and the key lever to their at rest positions. A bail which may be selectively positioned in cooperative relationship with a projection on the actuating pawl may be used to lock the key levers against actuation. A frame member is employed to pivot the pawl near the end of the down stroke of the key lever and thereby release the resilient contact spring. The cited frame member, the pawl and the key lever coact to provide a down stop limit for the key lever. Alternate selective means may be provided for locking selected key levers against actuation. In the structure shown, selected key levers are pivoted from a forward position while other key levers are pivoted from a rearward position. The circuit of the cited capacitor is designed to assure discharge of the cited capacitor well within the cycle time of operation of a given key lever.

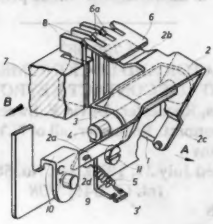
3,700,088
BLOCKING DEVICE FOR THE CARRIAGE OF TYPEWRITERS AND SIMILAR MACHINES

Detlef Kunst, Sanderbusch, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

Filed May 8, 1970, Ser. No. 35,661
Claims priority, application Germany, May 14, 1969, P 19 24 601.6
Int. Cl. B41j *19/90*
U.S. Cl. 197—120 2 Claims

A device for blocking the carriage of typewriters and similar machines during the performance of line shifts has a switching bar which can be displaced in the direction of the movement of the carriage and is mounted to be pivoted in a direction perpendicular to the movement of the carriage. This switching

bar is operable to be actuated by the line-shift key, and is provided with a blocking member defining a plurality of open slots engageable with a plurality of stop members on the carriage to block the carriage. A push rod is also provided on the



switching bar which is operable to interrupt the carriage return movement. Once the carriage return movement is interrupted, the switching bar is returned to its rest position by a suitable tension spring.

3,700,089

ANALYZER APPARATUS

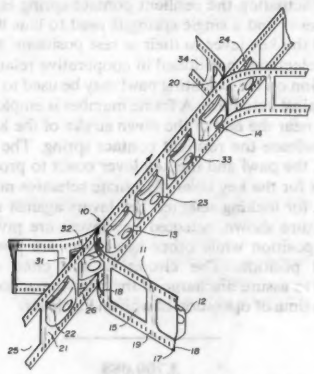
Ingomar Halbartschlager, Basel, and Alfred Helm, Mohlin, both of Switzerland, assignors to Hoffmann-La Roche, Inc., Nutley, N.J.

Filed May 20, 1971, Ser. No. 145,152

Claims priority, application Switzerland, June 1, 1970, 8161/70

Int. Cl. B65g ; B65d *83/00*

U.S. Cl. 198—1 **9 Claims**



An analytical apparatus for use in transporting in an automatic analyzer, a plurality of individual analytical samples having several transport bands each band including one or more receptacles for containing samples alternating with one or more apertures, the bands being offset with respect to one another to display at a position on one band a receptacle where all other bands have apertures thereby enabling the bands to be married to each other to form a continuous series of receptacles for passage by a sample transfer station and further enabling the bands to be individually passed through separate analyzing stations.

3,700,090

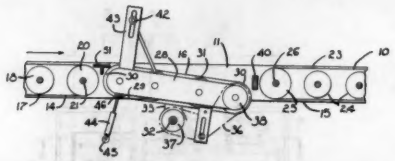
CONVEYOR AND ARTICLE FOR HANDLING APPARATUS

Reinhold A. Pearson, deceased, late of Spokane, Wash. (by Alma Pearson, executrix), assignor to R. A. Pearson Company, Spokane, Wash.

Filed March 12, 1971, Ser. No. 123,701

Int. Cl. B65g *47/26, 37/00*

U.S. Cl. 198—34 **13 Claims**



An apparatus for longitudinally spacing articles on a conveyor as they are carried along a first conveyor. An adjacent longitudinally aligned conveyor surface receives each article. One of the adjacent ends of the conveyor surfaces is moved elevationally relative to the other. A transverse stop is spaced above the conveyor surfaces adjacent to the rear end of the receiving conveyor surface. Movement of the surface alternately positions the stop for clearance of articles moving beneath it for blocking movement of an oncoming article. A forward stop is provided for collecting articles on the receiving conveyor surface when desired.

3,700,091

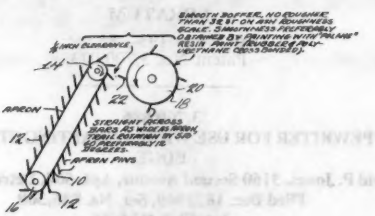
FIBER TRANSPORTING DEVICE

Kenneth G. Lytton; David F. Hullett, and George J. Miller, all of Gastonia, N.C., assignors to Fiber Controls Corporation, Gastonia, N.C.

Filed Jan. 29, 1971, Ser. No. 111,013

Int. Cl. B65g *29/00, 37/00*

U.S. Cl. 198—103 **8 Claims**



The doffer of this invention includes a rotatable cylindrical structure with a plurality of solid doffing blades (equal in width to the apron width) extending outwardly and backwardly (with respect to the direction of doffer rotation) from the cylinder circumference at an incline (5 to 60°) with respect to a radially directed reference line. The entire cylinder and doffer blade assembly is painted with a synthetic resin paint or otherwise treated to insure a substantially smooth outer surface. (A finish of 32 or smoother on a standard finish scale is sufficient.)

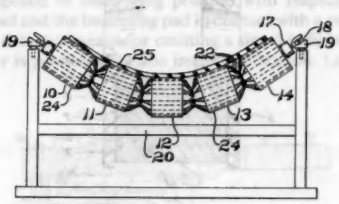
In operation, this cylindrical doffer is preferably mounted for rotation such that the blades pass by the apron in the same direction as the moving apron pins but without any intermeshing therebetween. (A clearance of approximately ¼ inch is provided.) As the doffer is rotated at fairly high speeds, a doffing sheet of moving air is generated over the entire width of the apron to remove fibers therefrom (i.e. fanning action). In addition, because of the extreme smoothness of the outer doffer surfaces, stray fibers are in no way caught up in the doffer itself to accumulate and interfere with the desired doffing operation.

3,700,092

CATENARY ROLL SUPPORT FOR A CONVEYOR BELT

Amos J. Stark, and Hebert E. McGinnis, both of Akron, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed April 21, 1971, Ser. No. 135,924
Int. Cl. B65g *15/08*
U.S. Cl. 198—192 R **8 Claims**



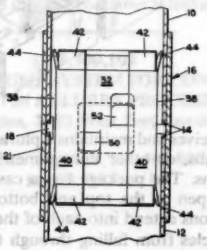
A catenary type roll support for a troughed conveyor belt has cylindrical segments connected solely by tapes fastened to the surfaces of the cylindrical segments, and the first and last segments are suspended from fixed supports by anti-friction bearings.

3,700,093

TROUGH COUPLER WITH CHAIN GUIDE FOR CHAIN CONVEYOR TYPE ANIMAL FEEDER

Robert L. Van Huis, Zeeland, Mich., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Sept. 21, 1970, Ser. No. 74,081
Int. Cl. B65g *15/60*
U.S. Cl. 198—204 **21 Claims**



A feeder trough connected in a manner which wedges a chain guide between the trough sections. The chain guide has depending leg portions which extend down between adjacent ends of the trough sections, abutting the same. The leg portions rest upon a specially shaped portion of a connecting section which latter section removably holds the trough sections together by conventional straps.

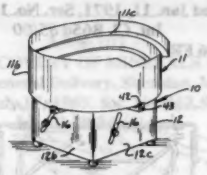
3,700,094

VIBRATORY FEEDER BOWL DRIVE APPARATUS

Michael K. Parr, 5169 East State Street, Apt. 211, Building 3, Rockford, Ill.

Filed Aug. 2, 1971, Ser. No. 168,328
Int. Cl. B65g *27/00*
U.S. Cl. 198—220 BC **10 Claims**

A feeder bowl drive apparatus for imparting angular and axial vibratory movement to a parts feeder bowl in which a feeder bowl support is resiliently mounted on the base by a leaf spring assemblies angularly spaced about the axis of the feeder bowl. The springs are adjustably mounted on the base to enable adjustment of the effective length of the spring for tuning of the natural frequency of vibration of the vibratory body and the leaf spring mountings on the base and on the bowl support are self-aligning with the leaf springs to avoid introduction of nonuniform spring tensions in the leaf springs.

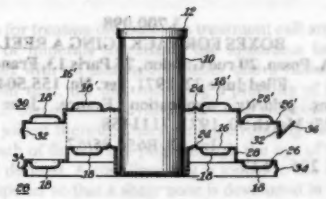


3,700,095

PILL OR CAPSULE DISPENSER: SURE DAILY REMINDER

Thomas C. Dangles, and Elsie R. M. Dangles, both of 10424 South Lavergne Avenue, Oak Lawn, Ill.

Filed July 20, 1971, Ser. No. 164,281
Int. Cl. B65d *83/04*
U.S. Cl. 206—42 **6 Claims**



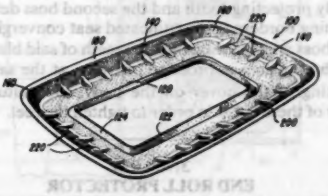
A dispenser for pills and/or capsules adapted to cooperate with a container having pills and/or capsules therein. First and second horizontal disc like members detachably engage each other and support the container in a vertical position as it extends through central openings in both members. The members each have two concentric annular sectors having respective lower and upper mating recesses which together define enclosed chambers for detachably receiving pills and/or capsules.

3,700,096

FOOD PACKAGING TRAY

Richard F. Reifers, New Canaan, Conn., assignor to Diamond International Corporation, New York, N.Y.

Filed March 30, 1970, Ser. No. 23,776
Int. Cl. B65d *65/16*
U.S. Cl. 206—45.33 **11 Claims**



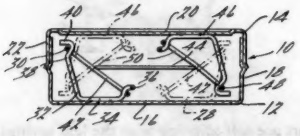
A tray of molded pulp or the like is provided for the packaging of meat, poultry and fish in conjunction with an overwrapped plastic film. The tray is constructed with a corrugated series of bowed portions projecting convexly toward the interior of the tray along the edge joining the bottom of the tray to the four side walls.

3,700,097

SHIPPING CONTAINER FOR FRAGILE ARTICLES

Neal C. Thomas, Brighton, Mich., assignor to The Bendix Corporation

Filed Jan. 11, 1971, Ser. No. 105,501
Int. Cl. B65d *85/00*
U.S. Cl. 206—46 FR **11 Claims**



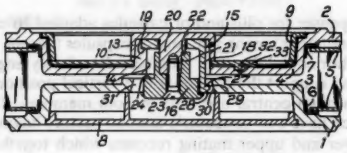
A shipping container for generally disk-shape fragile articles comprising a generally cup-shape base having a bottom wall and an upright side wall, a generally cup-shape cover having a top wall and a depending side wall disposed in a telescoping relation with the base side wall and a plurality of rubber bands trained about brackets supported on the top and bottom walls so as to form a plurality of flexible strips arranged in opposed frusto-conical patterns in which they can support a disk-shape article therebetween so as to maintain the article in a spaced relation with the container walls.

3,700,098

BOXES FOR PACKAGING A REEL

Pierre A. Posso, 20 rue Gandon, 75 Paris 13, France

Filed June 22, 1971, Ser. No. 155,504
Claims priority, application France, June 23, 1970, 7023225; March 30, 1971, 7111158
Int. Cl. B65d *85/67*
U.S. Cl. 206—52 F **10 Claims**



This invention relates to a box for the packaging of a reel of cinematographic film, magnetic tape or the like, comprising a body and a cover unitary with means provided for centering the reel and in which there is incorporated a locking device comprising an expansible means and a rotary actuation cam, wherein the expansible means comprises at least three flexible blades extending freely in directions substantially parallel to the axis of rotation of the cam rotatably mounted in one of the bosses, the base of each blade is immobilized in this first boss, the free end of each blade bears against the cam and has an outwardly projecting tooth and the second boss defines a central opening bordered by a truncated seat converging towards the first boss and against which the teeth of said blades may be pressed by the cam in order to provoke, at the same time as the locking of the cover on the body, the mutual bringing together of these latter in order to tighten the reel.

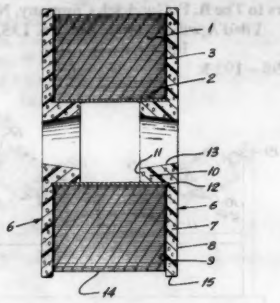
3,700,099

END ROLL PROTECTOR

J. Omer Heroux, 1698 Gouin Boulevard, Montreal, Quebec, Canada

Filed Nov. 3, 1970, Ser. No. 86,578
Int. Cl. B65d *85/67*
U.S. Cl. 206—59 F **2 Claims**

This invention relates to protectors for the ends of rolls of flexible sheet or strip. These protectors consist of discs having a central coaxial extension adapted to be frictionally retained in the hollow core of the roll. They serve to protect the sheet



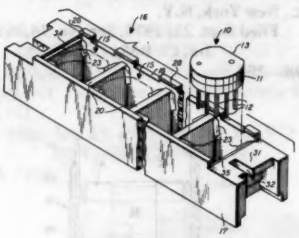
or strip against damage and reduce the wrapping required for the roll.

3,700,100

PACKAGE

William D. Bohannon, Jr., Graham, N.C., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed June 29, 1970, Ser. No. 50,547
Int. Cl. B63d *71/00*
U.S. Cl. 206—65 F **6 Claims**



A package receives and maintains a plurality of articles having flat sides, tabs, or other nonsymmetrical dimensions in oriented positions. The package has a casing with a row of compartments open at the top and bottom. A plurality of resilient projections extend into each of the compartments to support the articles from falling through the open bottoms. The compartment walls mate with the nonsymmetrical dimensions of the articles to maintain the articles in oriented positions. A cover is secured over the top of the compartments to contain the articles. The cover has apertures aligned with each compartment such that a finger or pusher may be inserted into each compartment to force each article past the resilient projections out the bottom of the compartment without removing the cover.

3,700,101

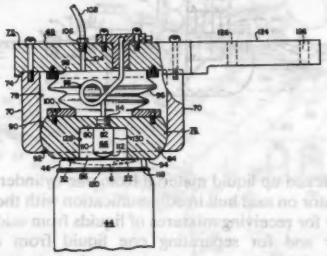
CONTAINER INSPECTION APPARATUS

Richard N. Ference, Trafford; Albert Grega, Monroeville; James A. Miller, Apollo; Ray T. Stewart, New Kensington, and David M. Stricker, Lower Burrel, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed May 18, 1971, Ser. No. 144,424
Int. Cl. B07c *5/344*
U.S. Cl. 209—80 **13 Claims**

Apparatus for inspecting sealed containers, including vacuum sealed containers having deflectable panel indicators. A sensing head having an electrically insulating pad and a generally centrally disposed eddy current sensor secured within a bore of the pad. The insulating pad and eddy current

sensor are urged downwardly by a restraining means and are adapted to be moved upwardly uniformly or irregularly responsive to contact with a container wall. The eddy current sensor has a lower surface disposed radially inwardly and spaced upwardly with respect to the annular lower surface of the insulating pad. Conveyor means adapted to move a plurality of sealed containers to an inspection station with the containers disposed in underlying position with respect to the sensing head and the insulating pad in contact with a container wall. First detector means for emitting a signal indicating that a container is positioned at the inspection station. Logic circuit means responsive to an eddy current sensor reading sampled after the first detector means signal to compare the sensor reading with a predetermined standard incorporated within the sensor control circuit means and emit a signal indicating whether the container at the inspection station is properly sealed. Reject means for removing improperly sealed containers from said conveyor means responsive to the circuit means signal indicating that the container is improperly sealed. Second detector means for emitting an indication that a container has emerged from the inspection station for initiating operation of the reject means when the circuit means signal has indicated that the container is improperly sealed.

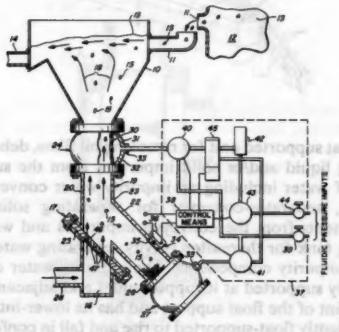


3,700,102

AUTOMATIC DUMP SYSTEM FOR CONTAMINANTS COLLECTED IN A SLURRY PROCESSING SUMP

Lawrence M. Higgins, 2952 West Port Royale Lane, Phoenix, Ariz.

Filed Dec. 24, 1969, Ser. No. 887,913
Int. Cl. B03b *3/34*
U.S. Cl. 209—158 **9 Claims**



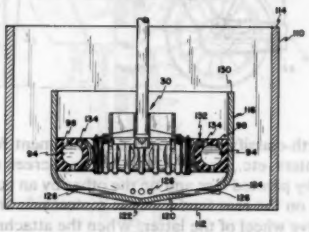
An automatic dump system for use with a slurry processing sump is disclosed. It has a flushing chamber and a collection chamber attached to the lower end of the sump. A flushing fluid is supplied to the flushing chamber to deflect relatively heavy contaminating materials into the collection chamber, and provide resistance to settlement of relatively light slurry materials. Both the flushing chamber and the collection chamber have valves which are controlled by an actuation means to periodically discharge collected contaminating materials without interrupting sump operation.

3,700,103

RECOVERY OF MINERALS

Walter C. Giebel, General Delivery, Sheridan, Mont.

Filed July 17, 1969, Ser. No. 842,528
Int. Cl. B03d *1/14*
U.S. Cl. 209—169 **12 Claims**



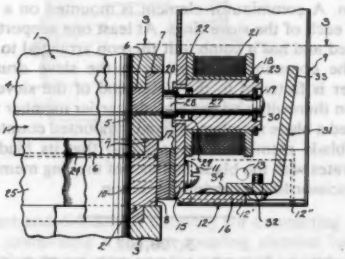
Apparatus for treating ore pulp in a treatment cell attendant to recovery of minerals therefrom, the apparatus having a rotatable shaft with an attached impeller and a radially projecting annular disc, the disc including a plurality of projections attached thereto and a cylindrical collar disposed above the disc and joined thereto, thus forming a rotating standpipe so that the path of flow of ore pulp through the eye of the impeller is well defined. A stabilizer ring is joined to the cell adjacent the impeller so that a shear zone is developed in the ore pulp, the stabilizer ring being configurated to maximize turbulence in the shear zone and minimize surging and boiling of the ore pulp at the surface thereof. An insert is adapted to nest within a rectangular cell so that the rectangular cell operatively receives the stabilizer ring.

3,700,104

TRANSVERSE TAPPER ASSEMBLY FOR SIFTER SIEVE STACK

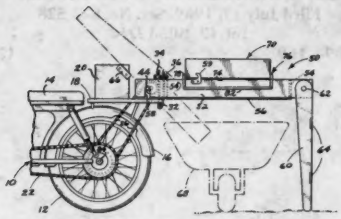
Robert L. Schurrer, Milwaukee, Wis., assignor to ATM Corporation, Greendale, Wis.

Filed Oct. 15, 1970, Ser. No. 81,094
Int. Cl. B07b *1/54*
U.S. Cl. 209—237 **4 Claims**



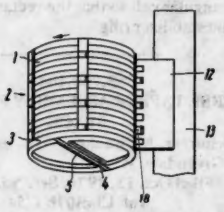
A tapper assembly for the sieve stack of a reciprocating air column sifter includes a mounting ring that is incorporated into the stack. The ring mounts two oppositely disposed transverse tappers which are alternately electromagnetically actuated to tap the sieve above the mounting ring.

3,700,105
VIBRATING SCREEN, EARTH-CLASSIFYING MOTORCYCLE ATTACHMENT
Delbert A. Piper, Lexington, Oreg.
Filed July 21, 1971, Ser. No. 164,514
Int. Cl. B07b *1/42*
U.S. Cl. 209—421 **8 Claims**



An earth-classifying motorcycle attachment for use by artifact hunters, etc., comprises a vibrating screen supported on one end by pivoted legs and on the other by an eccentric drive mounted on the rear fender of the motorcycle and connected to the drive wheel of the latter. When the attachment is not in use, the eccentric drive may be disconnected and the screen and legs folded back for transport from place to place.

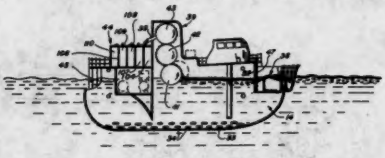
3,700,106
COMMINUTOR
Paul Wittke, Niederrodenbach, Germany, assignor to Condux-Werk Herbert A. Merges KG, Wolfgang, Germany
Filed Nov. 6, 1970, Ser. No. 87,455
Claims priority, application Germany, Nov. 11, 1969, P 19 56 607.5
Int. Cl. B01d *35/28*
U.S. Cl. 210—174 **4 Claims**



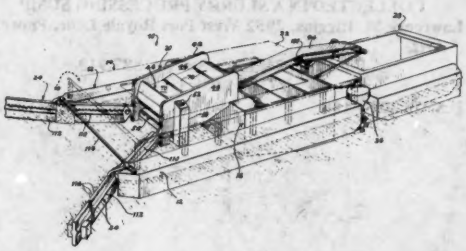
A comminutor for coarse materials and to be installed in sewage channels has a rotatably mounted sieve drum having a plurality of sieve rings arranged in spaced relationship thereon. A comminutor element is mounted on a respective one of each of the sieve rings. At least one support column is provided and has a comb unit thereon arranged to cooperate with the comminutor element on the sieve drum. A ring member is fastened to the lower end of the sieve drum for rotation therewith and has a blade carrier member to which is attached a blade member. A fixedly mounted counterring having a blade member is arranged so that its blade member cooperates with the blade member of the ring member to provide a scissor-like comminuting action.

3,700,107
APPARATUS FOR RECOVERY OF FLOATING SUBSTANCES
Edmond Flaviani, 719 28th Avenue, San Francisco, Calif.
Filed Nov. 18, 1970, Ser. No. 90,544
Int. Cl. C02b *9/02;* **E02b** *15/04*
U.S. Cl. 210—242 **11 Claims**

The disclosure relates to a propelled hull having an open front as well as an open rear, a scoop removably mounted on the hull at its open front for picking up from the surface of water mixtures of water and pollution material floating thereon, together with an upright partition fixedly secured in said hull, a housing supported on said partition, a plurality of rotatable cylinders mounted in vertically arranged engagement to one another within said housing; said cylinders having spirally arranged grooves in the peripheries thereof for transfering picked up liquid material from one cylinder to another, a separator on said hull in communication with the uppermost cylinder for receiving mixtures of liquids from said uppermost cylinder and for separating one liquid from another for discharge into separate areas, means for rotating said cylinders, and means at the rear of said hull for discharging separated liquids from said separate areas of said hull to a remote location.



3,700,108
OIL SKIMMER
Frank A. Richards, 11 Martha Drive, Bowmansville, N.Y.
Filed Feb. 4, 1971, Ser. No. 112,598
Int. Cl. C02b *9/02*
U.S. Cl. 210—242 **6 Claims**



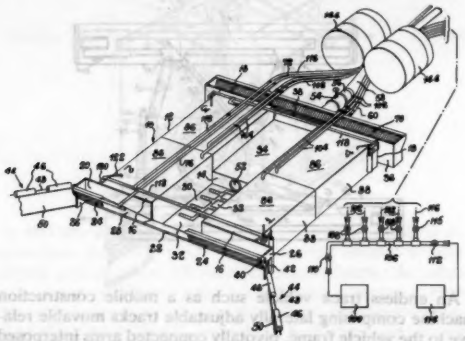
A float supported unit for removing oil films, debris or other floating liquid and/or solid impurities from the surface of a body of water including an impurity-water conveyor, a perforated, separator-conveyor for separating solid impurity components from the conveyed impurities and water, and a holding tank for thereafter gravity separating water from the liquid impurity components. The impurity-water conveyor is pivotally supported at its upper-outlet end adjacent a fore-aft mid-point of the float support and has its lower-intake end independently float-supported to rise and fall in conformity with the surface of the water adjacent the fore end of the float support. The impurity-water conveyor includes a plurality of relatively flexible paddle elements, which cooperate to elevate separate charges of impurities-water upwardly along a channel guide; each charge being formed and subsequently conveyed and separated with a minimum of emulsion inducing agitation, whereby to promote relatively rapid separation of the liquid impurity components from the water in the holding tank.

3,700,109

APPARATUS FOR REMOVING FLOATING LIQUIDS FROM THE SURFACE OF A BODY OF WATER

Charles J. Lasko, 4344 Washington Road, Parlin, N.J.

Filed Dec. 23, 1970, Ser. No. 101,016
Int. Cl. C02b *9/02*; E02b *15/04*
U.S. Cl. 210—242 **9 Claims**



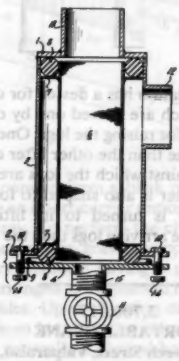
Apparatus for skimming liquids, such as oil, having a specific gravity less than that of water from the surface of a body of water including a pair of laterally spaced hulls supporting a basin between them and a skimming edge immediately ahead of the basin, the hulls including fore and aft chambers and means for admitting or expelling water independently into or out of each chamber to select the level and the fore and aft tilt of the hulls relative to the surface of the body of water so as to enable skimmed liquid to pass over the skimming edge and into the basin.

3,700,110

FLUID STRAINER

John Engalitcheff, Jr., Gibson Island, Md., assignor to Baltimore Aircoil Company, Inc., Jessup, Md.

Filed July 14, 1971, Ser. No. 162,557
Int. Cl. B01d *35/16, 27/00*
U.S. Cl. 210—308 **8 Claims**



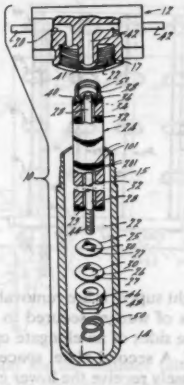
A fluid strainer including an elongated shell having an inlet at one end and connecting with an inner passageway of a filter cartridge mounted axially in the shell resting on resilient "O" rings which seal said filter cartridge in the shell.

3,700,111

LAMINAR FLOW FLUID FILTER

James Daniel Bode, Royal Oak, Mich., assignor to The Bendix Corporation

Filed Dec. 22, 1969, Ser. No. 887,102
Int. Cl. B01d *43/00*
U.S. Cl. 210—322 **18 Claims**



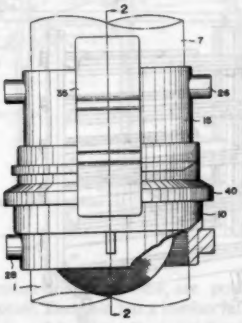
A stacked washer multi-stage impaction and diffusion filtering apparatus wherein a succession of laminar flow channels terminated by impact target surfaces are arranged to form intricate channel systems on individual filter washers, the washers then being stacked to form a plurality of filter passages. The intricate channel system permits establishment of a large number of filtration stages within a given volume.

3,700,112

HOSE COUPLING

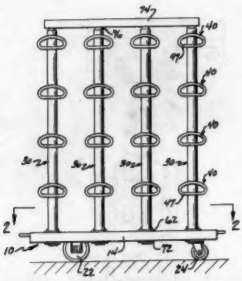
Sozaburo Maeshiba, 33-32,-4 chome, Hakataekimae, Fukuoka, Japan

Filed June 8, 1970, Ser. No. 44,198
Int. Cl. C02c *1/14*
U.S. Cl. 210—445 **3 Claims**



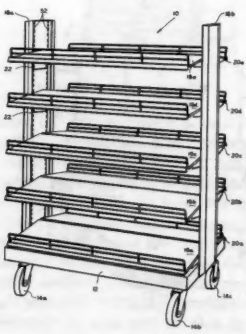
A connect-and-disconnect coupling for connecting a hose to a pipe, comprising a female coupling element having a tapered socket threaded to receive a tapered or conical male nozzle. The male nozzle has a plurality of pivotally mounted arms provided with hooked free ends that automatically hook over an outer collar on the female coupling element as the male nozzle is inserted into the socket and the tip thereof seats on a C-shaped annular seal in the female coupling element. The hooked arms hold the nozzle and female coupling element releasably in fixed relative axial positions.

3,700,113
TIRE STORAGE RACK
Clarence H. Hager, Rockford, Ill., assignor to Modern Caster Co., Inc., Rockford, Ill.
Filed Feb. 4, 1971, Ser. No. 112,577
Int. Cl. A47f 7/04
U.S. Cl. 211—23 **12 Claims**



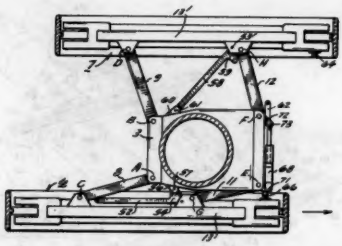
A plurality of upright supports are removably mounted on a mobile bed by means of wedges secured to the upright supports for engaging the sides of an elongate opening in a plate at the top of the bed. A second plate, spaced below the first plate, is shaped to closely receive the lower end of the upright support to complete the removable mounting arrangement. The upright support is tubular and has an internal strut extending in the lateral direction. A plurality of elongated arms are welded on each support member to support a tire. Each arm is formed into a tube from a continuous sheet of material and shaped with an arcuate upper portion and a generally flat bottom. The edges of the original sheet are located at the bottom of the tube and means is provided to hold the edges in a closed position.

3,700,114
ADJUSTABLE SHELF SUPPORT BRACKET
James E. Myers, Niles, Mich., assignor to Clark Equipment Company
Filed Jan. 18, 1971, Ser. No. 107,203
Int. Cl. A47g 29/02
U.S. Cl. 211—150 **6 Claims**



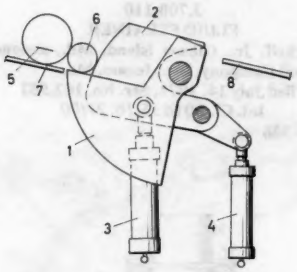
An adjustable shelf support bracket having a pair of oppositely extending cantilever type shelf support beams pivotally connected at their inner ends to a vertically adjustable inner plate with hooked tabs to connect the plate to a vertical column at a desired height. The angular orientation of each beam is determined by the engagement of an adjustment pin with an individual tooth chosen from a plurality of teeth formed in the inner end of the beam and such orientation may be varied by selectively changing the tooth engaged by the adjustment pin.

3,700,115
VEHICLE WITH VARIABLE WIDTH GROUND SUPPORTS
Kenneth V. Johnson, Oconomowoc, and David A. Miller, New Berlin, both of Wis., assignors to Koehring Company, Milwaukee, Wis.
Filed Sept. 17, 1970, Ser. No. 73,014
Int. Cl. B66c 23/36
U.S. Cl. 212—38 **6 Claims**



An endless track vehicle such as a mobile construction machine comprising laterally adjustable tracks movable relative to the vehicle frame, pivotally connected arms interposed between the frame and tracks, and locking means for independently and releasably securing each track in various lateral positions relative to the vehicle frame.

3,700,116
DOSING DEVICE FOR USE IN LOG HANDLING INSTALLATIONS
Ilkka Arimo Rysti, Frisanssintie 22, Frisans, Finland
Filed Nov. 5, 1969, Ser. No. 874,256
Int. Cl. B65g 11/00
U.S. Cl. 214—1 PB **2 Claims**

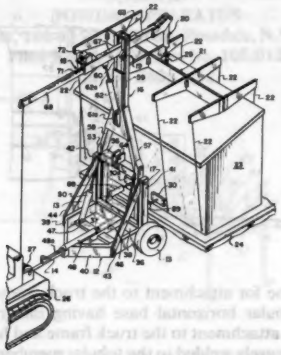


A log handling installation has a device for dosing transversely extending logs which are moved one by one. The device includes pairs of lifters for raising the logs. One of the lifters of each pair is of larger size than the other lifter of the same pair and has a threshold against which the logs are fed. The lower surface of the other lifter is also shaped to form a threshold. When the other lifter is turned to its lifting position its threshold is closer to the arriving logs than the threshold of the first lifter.

3,700,117
PORTABLE CRANE
Gale C. Corley, 1207 Beech Street, Valparaiso, Ind.
Filed March 4, 1971, Ser. No. 120,872
Int. Cl. B66c 23/40
U.S. Cl. 214—1 H **6 Claims**

A portable crane for lifting and positioning modular house sections from a trailer truck onto a foundation is provided with a pivotal post member which folds down onto a base and

wherein the crane jib pivots and folds against the post member so that the crane is reduced in size for transport. The lower end of the post member, when in a vertical position for lifting,



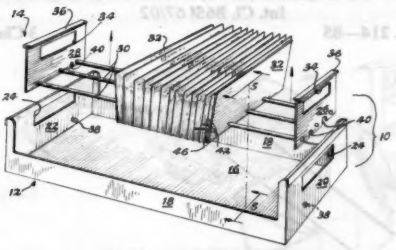
includes side support pads with elongated slots to allow transverse adjustment of the house section during positioning thereof onto a foundation.

3,700,118

CHECK SEPARATOR SYSTEM

Thomas H. Snethen, Dewittville, N.Y., assignor to United Business Equipment Corporation, Buffalo, N.Y.

Filed May 19, 1971, Ser. No. 144,798
Int. Cl. B65g *57/28*
U.S. Cl. 214—1 R **15 Claims**



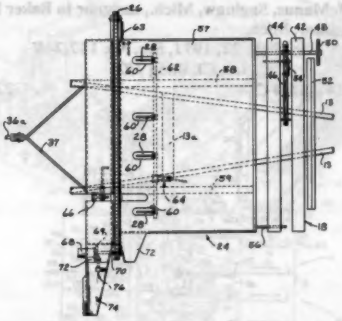
Checks are separated from a bank of checks and indexing guides carried by an insert-carrier removably supported within a storage-work tray. To perform the check separating operation, the insert-carrier is gravity supported on a vertically inclined vibratory platform having a plurality of separation assisting leaves arranged to be inserted into the bank of checks and indexing guides. Upon vibration of the platform, checks are gravity fed from between the indexing cards onto a platform supported, generally L-shaped holder, which is adapted to be manually withdrawn from adjacent the bank as the checks are separated therefrom. The holder is provided with side walls adjustable to accommodate for the length of the bank thereby to insure that the checks are constrained to remain on the holder in the same relationship they assumed in the bank.

3,700,119

TABLE EXTENSION FOR A BALE WAGON

Donald M. Grey, and Jerry W. Welker, both of Selma, Calif., assignors to Sperry Rand Corporation, New Holland, Pa.

Continuation of Ser. No. 828,881, May 29, 1969, abandoned. This application April 26, 1971, Ser. No. 137,601
Int. Cl. B65g *60/00*
U.S. Cl. 214—6 B **1 Claim**



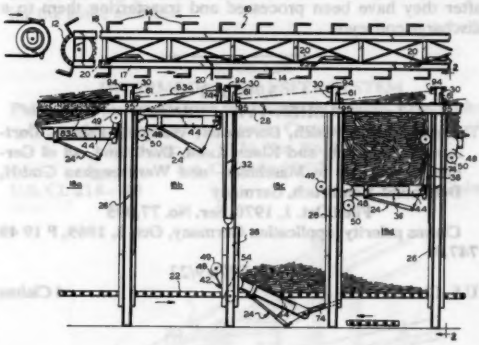
A table extension for the transfer table on a bale wagon which is adapted to be selectively positionable with respect to the table between a first bale engaging, guiding and turning position and a second stored position.

3,700,120

APPARATUS FOR COLLECTING AND DISCHARGING LUMBER

Roscoe B. Romick, and John G. Strauss, both of Portland, Oreg., assignors to U.S. Natural Resources, Inc., Portland, Oreg.

Filed Aug. 2, 1971, Ser. No. 168,103
Int. Cl. B65g *65/42*; B07c *3/08*
U.S. Cl. 214—16 B **22 Claims**



Multiple lumber-collecting bins are positioned below a lumber drop sorter. Each bin has a lumber let down apparatus including a series of horizontally extending parallel lumber-supporting arms cantilevered across the bin from a common support tube which travels along a vertical track. A lumber-receiving cable extends diagonally from an inner end of each arm upwardly to an upper portion of a swinging tip pivoted to the free end of each arm and then downwardly to a counterweight below each arm. At the beginning of a collecting cycle lumber drops from the sorter hooks onto the diagonal cables which minimize the fall and build a straight first course of lumber. As additional lumber drops on the cable, it sags progressively until the load is supported directly by the support arms, and the arms gradually lower through the bin. Near

the lower end of the bin the swinging tips swing outwardly and the support arms tilt downwardly to gradually spill the load onto a transfer chain defining the bottom of the bin. Thereafter the counterweights return the tips to their upright positions and hoist cables lift the support arms to the upper end of the bin to begin the next loading cycle.

3,700,121

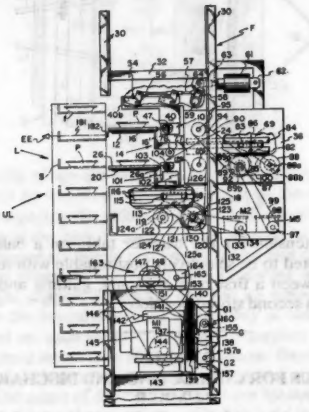
RACK LOADING AND UNLOADING APPARATUS

Lynn S. McManus, Saginaw, Mich., assignor to Baker Perkins, Inc., Saginaw, Mich.

Filed Feb. 22, 1971, Ser. No. 117,240

Int. Cl. B65g *1/06*

U.S. Cl. 214—16.4 C **22 Claims**



Rack loading and unloading apparatus for respectively transferring bakery products, such as pies in containers, from a supplying conveyor to a plurality of vertically spaced multi-shelved racks, which are moved in an endless path through a bakery processing unit, and removing products from the racks after they have been processed and transferring them to a discharge conveyor.

3,700,122

PUSHER-TYPE FURNACE

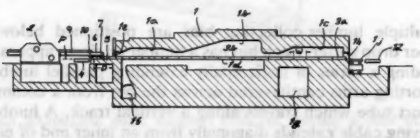
Theodor Josef Sevenich, Dortmund; Wolfgang Fabian, Dortmund-Hombruch, and Klaus Kuhn, Dortmund, all of Germany, assignors to Maschinen- und Werkzeugbau GmbH, Dortmund-Hombruch, Germany

Filed Oct. 1, 1970, Ser. No. 77,095

Claims priority, application Germany, Oct. 2, 1969, P 19 49 747.3

Int. Cl. F27b *9/22*

U.S. Cl. 214—24 **4 Claims**



A pusher-type furnace for the heating of metal ingots, blooms, billets or bars to rolling temperature, is provided at its inlet side with a billet-receiving platform or table upon which a pusher assembles one or more billets for advance into the furnace by a main pusher, the latter serving simultaneously to displace the entire array of workpieces and advance one or more of the latter out of the furnace.

3,700,123

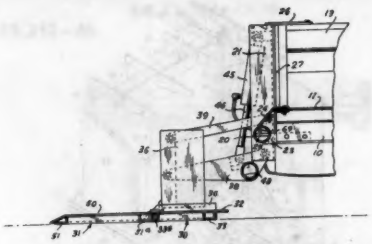
POWER LIFT AND GATE APPARATUS FOR TRUCK

Quentin D. Corley, Jr., 326 South Rock Island, Dallas, Tex.

Filed Aug. 16, 1971, Ser. No. 171,949

Int. Cl. B60p *1/48*

U.S. Cl. 214—77 P **12 Claims**



A lift frame for attachment to the truck frame and bed includes a tubular horizontal base having integral transverse brackets for attachment to the truck frame and having upright end posts securely welded to the tubular member. A mounting flange welded along the tubular member is secured along the edge of the truck bed. A hinged lift platform includes a horizontal portion and a folding portion, with the horizontal portion swingably supported by a parallelogram arms on the frame end posts. A torque bar connects lift arms, defining one of the parallel arms at each end; and a hydraulic power cylinder connects one lift arm and one corner post to swing the lift platform between the upper position in the plane of the truck bed and the lower ground position. In the upper limit position, the torque bar is stressed by the power cylinder so that the folding portion may be swung into upright position to define a g· te, with co-acting latch mains of the gate and one end post positioned for latching engagement. When the power cylinder is released, the torque bar positively latches the gate in locked position.

3,700,124

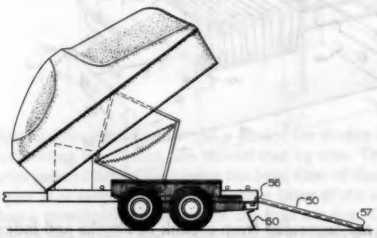
TRAILER LOADING AND UNLOADING EQUIPMENT

Richard A. Lawrence, 2737 Silverhill Drive, Pontiac, Mich.

Filed June 29, 1971, Ser. No. 158,023

Int. Cl. B65f *67/02*

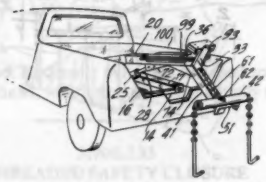
U.S. Cl. 214—85 **3 Claims**



A trailer for hauling wheeled loads too heavy for manual lifting for the average person having a ramp-platform positionable at the rear end of the trailer floor and removable therefrom and insertable below the trailer floor on slide flanges for travel where it is secured for travel. The tail-gate is hinged at the bottom and upon opening swings down into contact with the ground surface and acts as a support leg at the rear end of the trailer to prevent tipping when loading and unloading. A pivotally mounted cross-rod at the rear of the floor below the slide flanges has radial lifting and lowering arms for receiving the front end of the ramp at the rear end of the floor when the operator slides the ramp out from below the floor. A lever on the rod enables the user to pivot the rod and lift-lower

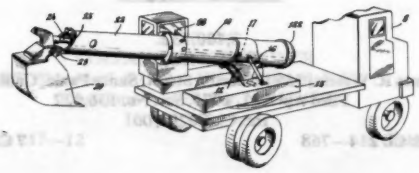
arms to raise and hold the front end of the ramp at the rear end of the floor. To again stow the ramp for travel, the user reversely pivots the rod with the hand lever to lower the front end of the ramp and then slides the ramp on the flanges below the floor.

3,700,125
TOWING APPARATUS
Joseph Aquila, 144-41 231st Street, Rosedale, N.Y.
Filed Jan. 8, 1971, Ser. No. 105,012
Int. Cl. B60p *3/12*
U.S. Cl. 214—86 A **14 Claims**



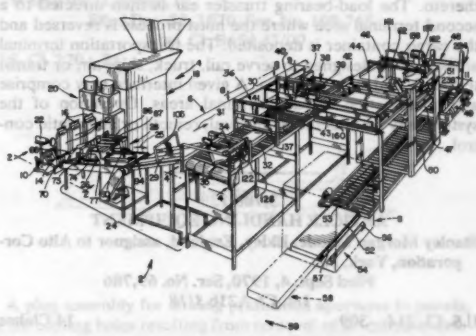
A truck mounted crane for pulling automobiles is constructed with a tubular boom pivoted at its front end to a base, with a fluid operated power cylinder being used to raise the rear end of the boom. A tow bar assembly mounted to the boom includes a boom extension that is mounted in telescoping relationship with the boom and a cross-bar supported from below at its center by a universal joint connected to the boom extension at the free end thereof. The tow bar assembly is movable between an extended or operating position and a retracted or storage position. In the operating or extended position, the boom extension projects downwardly and to the rear of the boom, and in the retracted position the boom extension is nested within the boom.

3,700,126
HYDRAULIC BOOM FOR EARTH EXCAVATING APPARATUS
Joseph R. Beaton, Hillside Terrace, Oneida, N.Y.
Filed Aug. 16, 1971, Ser. No. 171,901
Int. Cl. E02f *3/00*
U.S. Cl. 214—141 **7 Claims**



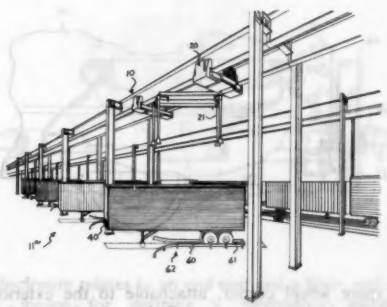
A boom for earth excavating apparatus comprises a first elongated tubular shaped member, a second elongated tubular shaped tool supporting member positioned within the first member and adapted for telescoping movement therein, a hydraulic cylinder positioned within the outer boom member, means for constraining motion of the cylinder in a longitudinal direction with respect to the outer boom member, a hydraulic piston positioned within the cylinder and coupled to the second member for causing longitudinal motion of the second tubular member when a hydraulic force is applied thereto, means intercoupling the cylinder and the second boom member for guiding motion of said second member in a longitudinal direction and for causing rotation about a longitudinal axis thereof when the cylinder is rotated, and means for providing rotation of the cylinder thereby causing rotation of the second member and the tool about a longitudinal axis.

3,700,127
METHOD FOR ASSEMBLING LAYERS OF PACKAGES ON A PALLET
Kenneth G. Kurk, and Robert S. Kilbride, both of Quincy, Ill., assignors to Moorman Manufacturing Company, Quincy, Ill.
Filed Nov. 16, 1970, Ser. No. 89,658
Int. Cl. B65g *57/26*
U.S. Cl. 214—152 **5 Claims**



A method and apparatus for arranging bags in layers with the sewn end of each bag in each layer facing inwardly of the layer and for depositing each layer on a pallet. Some bags are turned 180° and some bags are turned 90° while the bags are being conveyed to a marshalling station where the bags are gathered sequentially in groups. The first two groups are sequentially moved onto a plate to form a layer of bags having a predetermined pattern. Then, the plate is moved over a pallet and the layer is wiped off the plate over the pallet while the plate is retracted. The next two groups are arranged in a layer having a different pattern and deposited over the pallet in like manner. These steps are repeated several times to quickly deposit eight layers on the pallet with adjacent layers having interlocking patterns. Preferably, 90° turning of a bag is accomplished by blocking movement of the bag on one side near one end while quickly moving a guide member along the other side of the bag toward the other end and then quickly retracting the guide member.

3,700,128
INTERMODAL TRANSFER SYSTEM
Philip S. Noble, North East, and James R. Chapin, Erie, both of Pa., assignors to General Electric Company
Filed Dec. 23, 1970, Ser. No. 101,009
Int. Cl. B65g *67/02*
U.S. Cl. 214—40 **11 Claims**



This interface system comprehends the transfer of containerized or trailerized loads between transportation media by means of overhead traffic flow. An overhead guideway net-

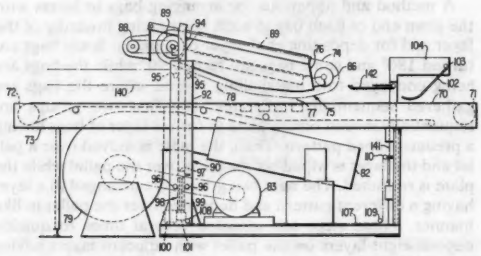
work connecting terminal areas for said transportation media serves as support and guide means for a plurality of self-propelled transfer cars. Each transfer car embodies a rotatable hoist and propulsion motors. By means of the propulsion motors, an individual transfer car is positioned along the overhead guideway above a designated load located at a given transportation terminal. The hoist is rotated into proper orientation for pickup, lowered, attached to the load, raise, re-rotated into alignment with the transfer car, and secured thereto. The load-bearing transfer car is then directed to a second terminal area where the hoist process is reversed and the cargo container is deposited. The transportation terminal areas may be designed to serve rail, truck, ship, air, or transit terminals and storage media. A given interface may comprise any combination of said terminal areas. Operation of the system may be directed by manual, remote or automatic control.

3,700,129

ARTICLE HANDLING EQUIPMENT

Stanley Morgan Maude, Ilkley, England, assignor to Alto Corporation, York, Pa.

Filed Sept. 4, 1970, Ser. No. 69,786
Int. Cl. A21b *3/18*
U.S. Cl. 214—309 **14 Claims**



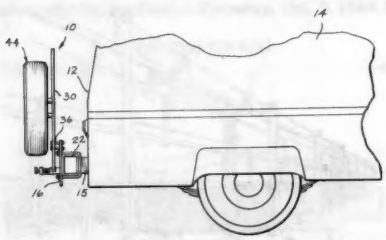
A suction depanner is provided having an automatic height adjustment means responsive to the height of the product to be depanned. Further, the depanner is provided with self-centering guides for aligning the product.

3,700,130

SPARE WHEEL CARRIER

Robert N. Holdread, 23 Fern Drive, Elkhart, Ind.

Continuation-in-part of Ser. No. 805,270, March 7, 1969, abandoned. This application June 29, 1970, Ser. No. 50,053
Int. Cl. B62d *43/00*
U.S. Cl. 214—454 **9 Claims**



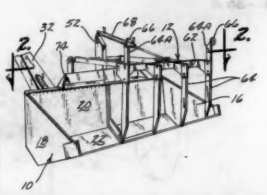
A spare wheel carrier, attachable to the exterior of a wheeled vehicle adjacent a wall thereof, which includes an arm pivotally connected to a bracket. The bracket is adapted for attachment to the vehicle so as to enable to the arm of the carrier to be swung in a substantially vertical plane parallel to the adjacent wall of the vehicle. Releasable lock means is provided in association with the bracket and arm to anchor the arm to the bracket and thus position a wheel mounting means carried by the arm in a wheel storing position.

3,700,131

GRAB FORK ATTACHMENT FOR A LOADER BUCKET

Walter J. Westendorf, Smithland, Iowa

Filed Jan. 25, 1971, Ser. No. 109,342
Int. Cl. B66f *9/18*
U.S. Cl. 214—767 **7 Claims**



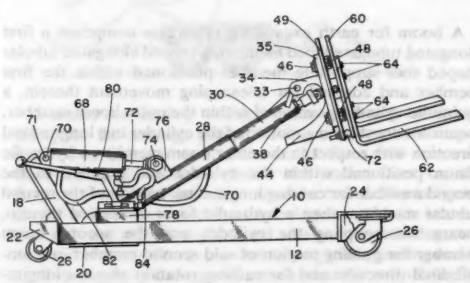
A grab fork attachment for a loader bucket which may be quickly attached thereto and removed therefrom. The attachment comprises a tower frame means which is adapted to be selectively secured to the rearward side of the loader bucket back wall and a pivotal arm means extending forwardly from the upper end of the tower frame means. A plurality of spaced apart forks or teeth elements are secured to the forward end of the arm means and extend downwardly therefrom towards the open forward end of the loader bucket. At least two of the teeth elements have extension means extending therefrom to add stability to the attachment when the attachment is removed from the loader bucket and positioned on the ground. A hydraulic cylinder means connects the forward end of the arm means and the tower frame means for movement of the teeth elements with respect to the loader bucket. A locking means is provided on the tower frame means and the rearward side of the loader bucket to permit the tower frame means to be quickly secured to the loader bucket. A clamp means is secured to the tower frame means and detachably receives the upper end of the loader bucket to further secure the attachment to the loader bucket. A modified form of the attachment is also disclosed wherein the hydraulic cylinder means is positioned rearwardly of the rearward side of the loader bucket. The method of mounting the attachment on the loader bucket is also disclosed.

3,700,132

FLOOR HOIST

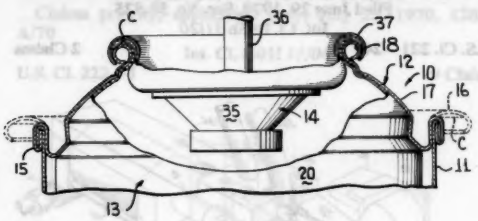
James R. Waters, 356 Princeton Street, Santa Paula, Calif.

Filed April 21, 1971, Ser. No. 136,022
Int. Cl. E02f *3/00*
U.S. Cl. 214—768 **7 Claims**

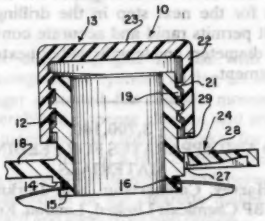


A low profile portable hydraulic hoist for handling heavy structures in cramped quarters. It includes a castered frame, a

pivoted arm mounted on the frame and an adjustable head means mounted on the end of the arm for holding the structure to be moved. Hydraulic cylinders are used to elevate the arm and tilt the head, which may also be manually rotated.

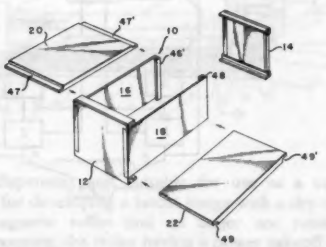


3,700,133
THREADED SAFETY CLOSURE
Richard B. Bagguley, Dolton, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Dec. 17, 1970, Ser. No. 99,206
Int. Cl. B65d *55/02*
U.S. Cl. 215—9 **1 Claim**



A safety closure comprising a cap threaded on a neck. The neck includes an upwardly biased safety button which seats in a notch on the lower edge of a cap screw. The safety button is seated in the notch and prevents turning of the cap and thereby removal of the latter from the neck until the button is depressed and disengaged from the notch.

3,700,134
COLLAPSIBLE CONTAINER
Russell T. Blanchard, P.O. Box 176, Engelhard, N.C.
Filed June 4, 1970, Ser. No. 43,479
Int. Cl. B65d *9/12*
U.S. Cl. 217—12 **4 Claims**

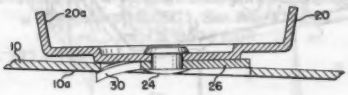


A collapsible container having high stacking strength and having means on the ends thereof cooperating with means on the sides, top and bottom to maintain the container in an operative condition without the use of fasteners.

ERRATUM

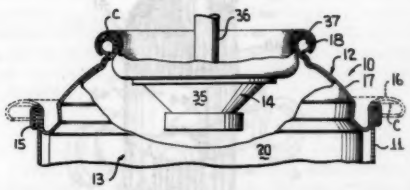
For Class 219—56 see:
Patent No. 3,699,756

3,700,135
HOLE PLUG
Frank J. Collier, East Dundee, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Dec. 22, 1970, Ser. No. 100,745
Int. Cl. B65d *45/00*
U.S. Cl. 220—25 **8 Claims**



A plug assembly for closing preformed apertures in panels, or for closing holes resulting from removal of so-called knockouts, and the like; and which includes a hole-closing shallow cup-like or dished formation with outward peripheral flange means and a spring disk fixed to the bottom of the cup-like formation by riveting, welding or the like and extending slightly outwardly beyond the cup-like formation for disposition in spaced relation to the flange means; and the spring disk being slit radially inwardly or provided with a cut-out portion with the adjacent portion being deflected downwardly to provide a leading ramp or cam surface so that insertion of the leading edge of the ramp through the panel aperture and wedging placement thereof under the blind face of the panel with subsequent rotation of the plug assembly in the direction of the leading edge of the ramp will effect progressive downward flexing of the trailing peripheral portions of the spring disk to underlie the blind face of the panel with the flange means engaging the accessible face of the panel and with the cup-like formation plugging the aperture in the panel.

3,700,136
END UNIT AND LINER FOR AEROSOL CONTAINERS
Herbert S. Ruekberg, Highland Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Division of Ser. No. 537,570, March 25, 1966, Pat. No. 3,423,818. This application Dec. 3, 1968, Ser. No. 780,807
Int. Cl. B65d *25/14*
U.S. Cl. 220—63 R **5 Claims**

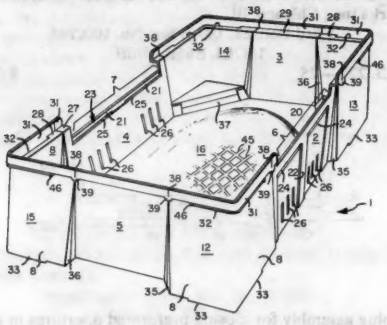


This disclosure relates to an end unit and a liner, and particularly means for defining a mechanical interlock therebetween, the liner being constructed from flexible material and having an annular radially outwardly opening groove, and the end unit having a central opening defined by a peripheral curl received in and interlocked with the annular groove of the liner.

3,700,137
PRODUCE SHIPPING CONTAINER

Augustine A. Souza, San Jose, Calif., assignor to Polygon Concepts, Los Altos, Calif.

Filed Jan. 20, 1971, Ser. No. 108,056
Int. Cl. B65d 21/06
U.S. Cl. 220—97 E 12 Claims

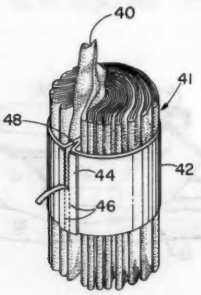


A container and its cover particularly suitable for use in the packing and shipping of produce is described. The container comprises a plurality of relatively thin sidewalls which are joined by moveable corner members adapted to assume an inwardly directed draft when in a nesting configuration and an outwardly directed draft when in a stacking configuration. The outwardly directed draft assumed by the corner members during stacking permits the loads encountered in stacking to be removed from the side walls and carried by the corner members. The cover corners and corner members of the container are further provided with mating grooves and beads which interlock in a male-female relationship during stacking. In addition, both the cover and bottom members of the container are domed to reduce slipping and twisting of one container relative to another stacked thereon during shipping.

3,700,138
METHOD OF DISPENSING INTERFOLDED SHEET MATERIAL AND PACKAGE THEREFOR

Howard N. Nelson, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 19, 1970, Ser. No. 91,110
Int. Cl. B65h 29/66
U.S. Cl. 221—51 4 Claims

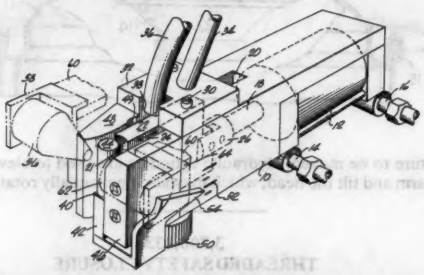


Interfolded sheet material such as facial tissues having a rectangular shape are folded upon themselves about an axis corresponding generally to the longitudinal centerline of an exterior tissue. The clip is then disposed in a cylindrical or other similar shaped package adapted to stand on end, and the individual tissues may be dispensed longitudinally.

3,700,139
RIVET SLUG INJECTOR

Earl K. Kelly, Lynwood, Calif., assignor to McDonnell Douglas Corporation

Filed June 29, 1970, Ser. No. 50,825
Int. Cl. B65h 31/20
U.S. Cl. 221—241 2 Claims

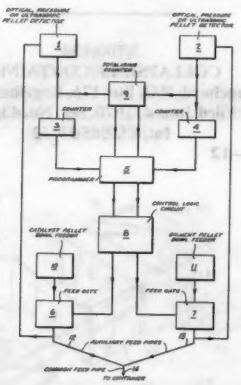


An intermittent acting mechanism receiving rivet slugs from the delivery tube of a rivet dispenser for injecting each slug into a spring loaded finger mechanism which, in turn, inserts the slug into a previously drilled hole for a rivet upsetting action by an automatic riveting machine. A photoelectric cell verifys insertion of the rivet slug into the finger mechanism and signals for the next step in the drilling operation. An adapter unit permits rapid and accurate conversion for slugs of different diameters and lengths without extensive alignment and readjustment.

3,700,140
METHOD AND APPARATUS FOR FEEDING PELLETED MATERIALS

Lawrence Harvey, Coldharbour, near Dorking, England, assignor to BP Chemicals Limited, London, England

Filed June 26, 1970, Ser. No. 50,287
Claims priority, application Great Britain, June 26, 1969, 32,361/69
Int. Cl. B67d 5/60
U.S. Cl. 222—1 9 Claims

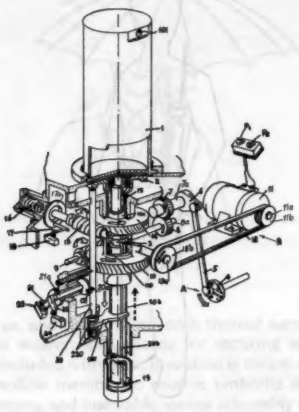


Granules or pellets of dissimilar materials are fed to a container in a predetermined ratio from a common feed pipe which is fed in turn from separate single line streams of counted pellets or granules metered to obtain parity with predetermined values.

3,700,141
GLUE DISPENSER FOR CIGARETTE MAKING MACHINE

Athos Cristiani, Bologna, Italy, assignor to AMF Incorporated

Filed June 30, 1971, Ser. No. 158,166
Claims priority, application Italy, July 23, 1970, 12835 A/70
Int. Cl. G01f 11/06
U.S. Cl. 222—1 9 Claims

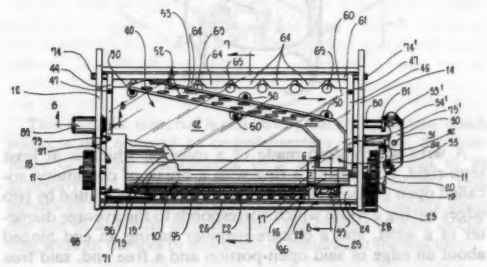


Apparatus for dispensing glue for use with a cigarette maker, which comprises a cylinder having an outlet orifice therein, a plunger mounted for slidable movement in the cylinder and operable to dispense glue out said orifice, means coupling the plunger and the cigarette maker for driving said plunger toward said orifice at a rate commensurate with the demand for glue of the cigarette maker, and means coupled to the plunger independent of the cigarette maker for driving said plunger toward and away from said orifice.

3,700,142
POWDER DISPENSING UNIT

Helmut K. Waibel, San Leandro, Calif., assignor to The Singer Company, New York, N.Y.

Filed Sept. 20, 1971, Ser. No. 181,988
Int. Cl. B67d 1/16
U.S. Cl. 222—109 11 Claims

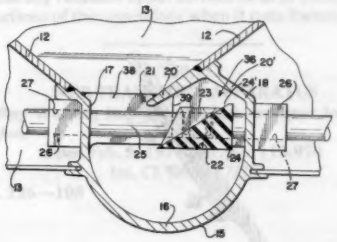


A powder dispensing unit suitable for use as a copier developer unit for developing a latent image with a dry toner powder. A magnetic roller and an auger are rotatably mounted in a housing: the roller having a power takeoff gear at one end and a power transfer gear and a camming disc at the other; the auger having an end-mounted driven gear mated with the power transfer gear. An end portion of the auger is mounted in a feed block having an upwardly extending chute aperture permitting toner feed upwardly toward an inlet portion of a toner distributor unit, which is reciprocably mounted in the housing. A rocker arm having a roller at each end—one contacting an undulating surface of the camming disc, the other contacting a camming post—reciprocates the toner distributor unit laterally in the housing. The toner distributor unit has a sloping, slotted distributor channel and a pair of sloping surfaces for gravity feeding toner powder therealong, and a trimming member to remove toner from the roller for admixture with toner fed along the distributor channel from the inlet.

3,700,143
PNEUMATIC DISCHARGE ARRANGEMENT FOR RAILWAY CAR HOPPERS

William R. Shaver, Munster, Ind., and James J. Schuller, Dolton, Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed March 5, 1971, Ser. No. 121,381
Int. Cl. B67d 1/08
U.S. Cl. 222—148 3 Claims

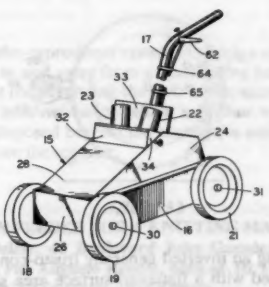


A pneumatic discharge arrangement for railway hopper cars comprises a housing divided into separate discharge chambers each including an elongated opening. The openings are regulated by valves slidably positioned. A trough is disposed beneath the openings for receiving materials therefrom and is adapted to be connected to a pneumatic conveying means. Each valve is movable to one side of the trough to an open position. A tunnel is provided at the top of the trough and is coextensive therewith above the valve in its open position. The tunnel facilitates cleaning of the upper surface of the valve at the completion of the discharge operation.

3,700,144
SPRAYING APPARATUS

Thomas J. Smrt, 4N 671 Route 59, Bartlett, Ill.

Filed Feb. 24, 1971, Ser. No. 118,351
Int. Cl. B67d 5/64
U.S. Cl. 222—176 15 Claims



A spraying apparatus which is particularly suitable for painting stripes on pavement, grass or the like. The apparatus includes a wheeled frame and an upwardly extending handle for pushing the frame over the surface that is to be marked. The frame includes a base plate which is provided with an opening to receive the valve end of an inverted aerosol spray can, and side plates extend from the base plate to maintain the

can in a substantially upright position. The valve of the can is actuated by a slide plate which is slidably secured to the base plate, and sliding movement of the slide plate is effected by a bell crank which is rotatably mounted on the frame. A cable extends along the handle between the bell crank and a trigger mounted on the upper end of the handle, and actuation of the trigger actuates the can valve to spray the marking contents of the can generally downwardly toward the surface.

3,700,145
CONTAINER FOR LOOSE MATERIAL

Franz Schluter, Bruhl, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt (Main), Germany

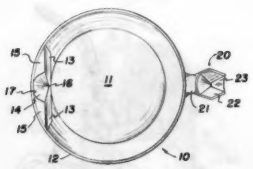
Filed May 28, 1968, Ser. No. 732,673
Claims priority, application Germany, June 20, 1967, P 15 06 866.3
Int. Cl. B65g *1/08*
U.S. Cl. 222—202 **3 Claims**

A container composed of a synthetic material such as polyethylene, epoxy or polyester resins and used for transporting powdery or granular materials, has a knocker base plate fastened to its wall. This plate protects the container when the plate is struck to loosen the powdery or granular materials.

3,700,146
CUP WITH POUR SPOUT AND CIRCULAR FINISH

Morison S. Cousins, Plainview, N.Y.; Rennold L. Klawson, Darien, Conn., and Roy Watson, Mt. Kisco, N.Y., assignors to General Foods Corporation, White Plaines, N.Y.

Filed March 25, 1970, Ser. No. 22,472
Int. Cl. A47g *19/22*
U.S. Cl. 222—465 **8 Claims**

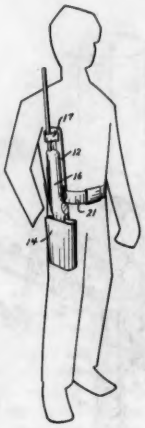


A cup having an inverted generally frusto-conical configuration is formed with a flattened surface area shaped to include a tapered channel extending between said surface area and the rim of said cup and constituting a pour spout disposed internally of the generally frusto-conical outline of said cup. An open handle attached to said cup near its rim, slanted at substantially the same angle as the cup side wall permits nesting of said cups in a compactly arranged stack. A bead formed on the circular rim or finish of the cup renders it adaptable for enclosure with a circular snap-on lid.

3,700,147
WEAPON CARRIER

Damon A. Vaughn, 1114 West Broadway Street, Madisonville, Ky.

Filed Sept. 14, 1970, Ser. No. 71,912
Int. Cl. F41c *33/00*
U.S. Cl. 224—2 A **4 Claims**

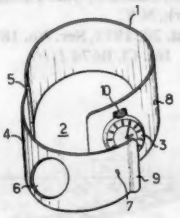


A weapon carrier mounted onto a belt or like member strapped to the user, and where the weapon, carried in a pivotal pocket, may be quickly and readily used without the necessity of removal from the carrier.

3,700,148
WRIST WATCH BRACELET

Lucie Lanvin, Paris, France, assignor to Jeanne Lanvin

Filed July 10, 1970, Ser. No. 53,899
Claims priority, application France, July 10, 1969, 6923429
Int. Cl. A44c *5/00*
U.S. Cl. 224—4 J **4 Claims**



A wrist-watch strap made of a material which is at least semi-rigid, comprising a ring with a break of continuity, so-called open portion, said open portion which is limited by two edges having a width which corresponds to the average diameter of a wrist, and a closure-member having an end hinged about an edge of said open-portion and a free end, said free end being adapted to overlap a portion of said ring in the vicinity of the other edge of said open-portion.

3,700,149
UMBRELLA HOLDER

Michael Grogan, 2179 Canal Road, Lake Park, Fla.

Filed Jan. 21, 1971, Ser. No. 108,318
Int. Cl. A45b *11/02*
U.S. Cl. 224—5.1 **9 Claims**

This invention is directed primarily to an elongated hollow substantially rigid member adapted to receive the shaft of an

umbrella, and having an elongated filament slidably connected with said elongated hollow member and extending the length of said hollow member, said filament having the central portion thereof formed as a loop adapted to surround the wearer by going over one shoulder and under the opposed arm

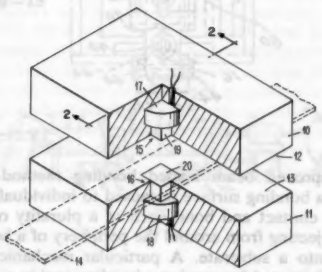
of the wearer, and the terminal ends thereof surrounding the waist of the wearer; and, means for securing said terminal ends. Also included within the invention is means adapting the elongated hollow member to receive umbrella shafts of different diameters, and insertable means releasably securing the umbrella shaft within the elongated hollow member.

3,700,150

METHOD AND APPARATUS FOR FRACTURING METAL

Raymond E. Cheney, Niwot, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 8, 1971, Ser. No. 151,028
Int. Cl. B26f *3/00*
U.S. Cl. 225—1 **7 Claims**



Thin metallic material is selectively cut by apparatus which subjects the material to complementary alternate displacement of a few microinches in a direction normal to its generally flat planar surface, the material stresses thus generated causing the metal to change state and fracture along the line of alternate displacement, the change in state occurring without the loss or distortion of material at the fracture.

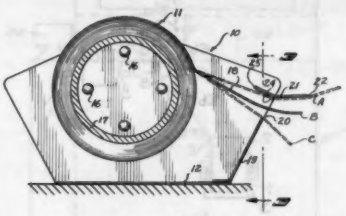
3,700,151

CELLOPHANE TAPE DISPENSER

Clifford L. Youngstrom, 304 Commonwealth Avenue, Duluth, Minn.

Continuation-in-part of Ser. No. 790,765, Jan. 13, 1969, abandoned. This application Oct. 7, 1970, Ser. No. 78,821
Int. Cl. B26f *3/02*
U.S. Cl. 225—26 **1 Claim**

A dispenser for supporting and dispensing pressure-sensitive transparent tape from a roll wherein the tape has adhesive on its inner wound surface, said dispenser having means for supporting the roll for unwinding rotation about a horizontal axis, a cutter bar mounted on the dispenser in substantial horizontal alignment with said axis and having a longitudinal V-shape and a serrated forward edge allowing an appendage



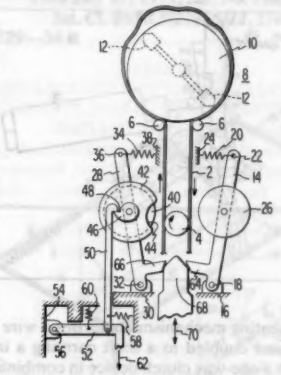
from the tape to be pulled forwardly under the bar with the dry side up, and a ledge spaced below the cutter bar and having a centrally recessed upper surface so as to contact only the edge portions of the appendage when it rests thereon.

3,700,152

WEB TRANSPORT APPARATUS

Henry Ray Warren, Indianapolis, Ind., assignor to RCA Corporation

Filed Feb. 9, 1971, Ser. No. 113,974
Int. Cl. B65h *17/20*
U.S. Cl. 226—108 **9 Claims**



In a recorder-reproducer system in which a recording web is transported to and away from a transducing head scanner, an arrangement for advancing the web to the scanner is disabled for a given interval during which a further web moving arrangement disposed beyond the scanner, is active to draw the web away from the scanner.

3,700,153

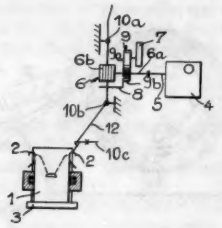
YARN FEEDER FOR A KNITTING MACHINE

Jean-Paul Delair, 40 Boulevard Jules Guesde; Raisin: Jean-pierre, 15 rue Auguste Renoir, both of 10 Troyes, and Eugene Voisin, 10 Souligny, all of France

Continuation-in-part of Ser. No. 821,792, May 5, 1969, abandoned. This application March 5, 1971, Ser. No. 121,440
Claims priority, application France, May 8, 1968, 68150975
Int. Cl. B65h *17/42*
U.S. Cl. 226—114 **6 Claims**

A yarn feeder for a knitting machine comprises a rotatable cylinder having an outer surface possessing a high coefficient of friction. A yarn guide is mounted for rotation on a common

axis with the cylinder and has fingers which engage yarn. A motor rotates the yarn guide between a position in which the



yarn is engaged by the cylinder and fed to the knitting machine and a position in which the yarn is disengaged from the cylinder.

3,700,154

INCREMENTAL DRIVE MECHANISMS

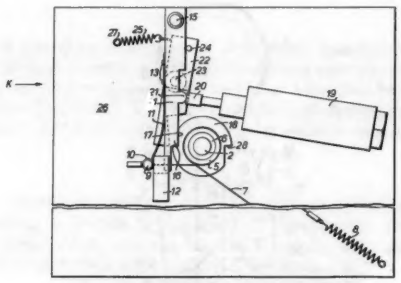
David Thomas Gwillim, Bransgore, and Robin Joseph Whiting, Broadstone, both of England, assignors to Plessey Handel Und Investments A.G., Zug, Switzerland

Filed Feb. 24, 1971, Ser. No. 118,335

Claims priority, application Great Britain, Feb. 25, 1970, 9,143/70

Int. Cl. B65h *17/22*

U.S. Cl. 226—156 **5 Claims**



A tape incrementing mechanism comprises a wire wrapped around a drum and coupled to a shaft carrying a tape drive sprocket through a one-way clutch device in combination with a piston and a lever for pulling the wire in one direction to rotate the shaft in one direction and so increment the tape the distance moved by the tape being accurately controlled by a stop cam co-operating with the levers to stop the shaft and sprocket after a predetermined angular movement thereof and a spring for pulling the wire back in the opposite direction without movement of the sprocket due to the interposition of the one-way clutch device.

3,700,155

APPARATUS FOR IMPROVING ALIGNMENT OF BEAM LEADED BONDING TOOLS

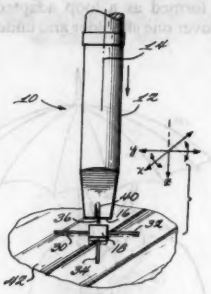
Leonard S. Hermanns, Woburn, Mass., assignor to Mech-El Industries, Inc., Woburn, Mass.

Filed May 20, 1970, Ser. No. 39,022

Int. Cl. B23k *21/00*; B23p *3/02*

U.S. Cl. 228—3 **3 Claims**

An improved bonding tool and method permitting improved accurate relative alignment of a bonding tool, a beam leaded device and a substrate onto which electrical leads from the beam leaded device are to be welded or bonded. Particular use is made of a unique reference area or point provided on the tool itself to aid in the alignment processes and in the preferred embodiment, a mirror surface is utilized to support the beam leaded device during alignment of this device with a



reference point on the tool thus further facilitating detection of minor relative misalignments which can then be corrected by an operator.

3,700,156

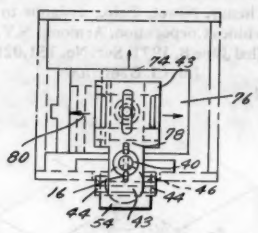
BONDING HEAD FOR BONDING BEAM LEADED DEVICES TO A SUBSTRATE

Leonard S. Hermanns, Woburn, Mass., assignor to Mech-El Industries, Inc., Woburn, Mass.

Filed May 20, 1970, Ser. No. 39,023

Int. Cl. B23k *1/00, 37/04*

U.S. Cl. 228—4 **6 Claims**



An improved beam leaded bonding method and head wherein a bonding surface is caused to individually and successively contact and bond each of a plurality of electrical leads projecting from around the periphery of a beam leaded device onto a substrate. A particular mechanical bonding head is illustrated for moving a bonding tool in a complex "wobbling" fashion to produce the desired individual and successive automatic lead bonding.

3,700,157

APPARATUS FOR FEEDING STRIP-LIKE MATERIAL TO A PROCESSING APPARATUS

Charles Storer Shumaker, Glenshaw, Pa., assignor to United Engineering and Foundry Company, Pittsburgh, Pa.

Filed June 9, 1971, Ser. No. 151,339

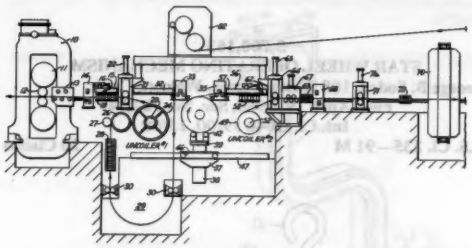
Claims priority, application Great Britain, July 13, 1970, 33,842/70

Int. Cl. B23k *1/20*

U.S. Cl. 228—5 **7 Claims**

This disclosure relates in one form to a method of and apparatus for feeding coils of metallic strip to a rolling mill or similar strip processing device in a manner that the device can be either operated continuously, e.g., it need not be stopped to receive succeeding coils to be processed, or intermittently, e.g., it requires interruption of the device to receive separate coils to be processed.

This combined operation is accomplished by providing two uncoilers, one of which feeds strip in a direction away from the mill to a strip accumulator. The second uncoiler is arranged to uncoil coils towards the mill when separate coils are to be rolled by the mill, but when the mill is to be operated to roll the coils continuously, the second uncoiler functions as part of a tension unit.



3,700,158

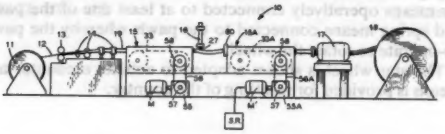
APPARATUS FOR MAKING THIN WALLED METAL TUBING

Friedrich Schatz, Karl-Kellner-Str. 62; Harry Stachewski, Gutenberg str. 20, both of 3012 Langenhagen, Germany, and Gunther Lehnert, deceased, late of Hannover, Germany (by Gerda Lehnert, administratrix)

Continuation-in-part of Ser. No. 659,792, Aug. 10, 1967, abandoned. This application April 23, 1970, Ser. No. 31,074

Int. Cl. B23k *1/20*

U.S. Cl. 228—15 **7 Claims**



Process and apparatus for forming metal tubing from thin metal strip with a longitudinally extending welded seam, and including means for moving and positively gripping the tubing as it is transported towards and beyond a welding station to thereby avoid any stresses which would have adverse affects on the tubing including the seamed area thereof.

3,700,159

FOLDABLE CONTAINER AND BLANKS THEREFOR

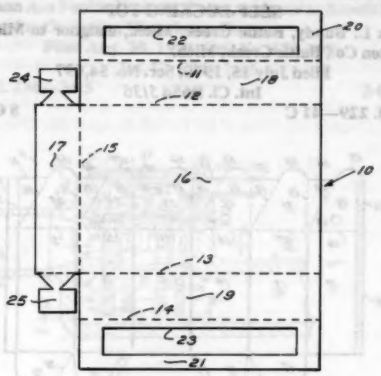
Raymond J. Beigel, 505 Xenia Avenue, Dayton, Ohio

Filed Nov. 9, 1970, Ser. No. 87,741

Int. Cl. B65d *5/32*

U.S. Cl. 229—19 **5 Claims**

A receptacle such as a container, box, tray, or the like includes two or more elements that are interconnected either in fixed, secured relationship, or for limited telescoping movement therebetween. The elements are each formed from a blank of foldable material such as paperboard, cardboard, or the like, and each has, in addition to a main panel, a first panel having a tab at one end thereof that is received between double walls of a second panel and is interconnected with one of said walls.



3,700,160

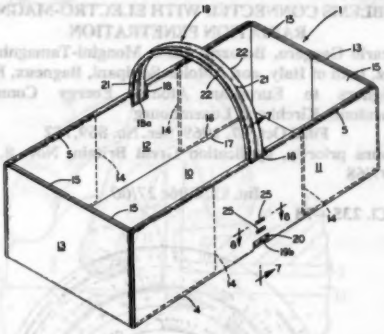
BASKET CONSTRUCTION

John D. Farrell, Canton, Ohio, assignor to Massillon Container Co., Navarre, Ohio

Filed July 27, 1971, Ser. No. 166,393

Int. Cl. B65d *5/22, 25/22, 5/46*

U.S. Cl. 229—34 R **9 Claims**



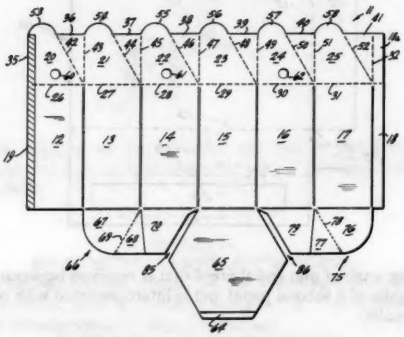
A basket for fruit and produce having corrugated board bottom and folded double thickness side and end walls in various sizes, such as peck and half-bushel, and having a plastic handle. The handle is formed of a flattened tubular plastic member such as extruded tubular polyethylene. The flattened handle preferably is generally oval in cross section and preferably has concave upper and lower walls and rounded edges in cross-section providing a double-thickness handle stiff enough to maintain its arched shape when stapled to the corrugated board basket side walls. The lower ends of the tubular plastic handle are each stapled by one or two staples to the outer layer only of the corrugated board side walls. The staples are engaged only with the outer layer of the flattened tubular handle member. An opening is formed at the outer corner between each basket side wall and the bottom wall midway between the ends for insertion of the anvil of a stapling tool exteriorly of the basket to telescope the anvil into an end of the tubular handle so that no clinched staple ends project to the interior of the basket.

3,700,161

FLAT FOLDABLE CARTON HAVING A PREFORMED, ANCHORED IN PLACE, AND FOLDED BOTTOM, WITH SELF-LOCKING TOP

Patrick L. Bundy, Battle Creek, Mich., assignor to Michigan Carton Co., Battle Creek, Mich.

Filed July 15, 1970, Ser. No. 54,997
Int. Cl. B65d 5/36
U.S. Cl. 229—41 C 8 Claims



A carton is provided which may be prepared from an integral blank and which when properly glued together, may be stored in flat folded condition. The folded carton may be quickly erected to form a carton in the form of a polygonal prism having a closed bottom and another end which is readily closable by interlocking a plurality of flaps.

3,700,162

CIRCULAR CALCULATOR FOR THE SOLUTION OF PROBLEMS CONNECTED WITH ELECTRO-MAGNETIC RADIATION PENETRATION

Giancarlo Gaggero, Besozzo; Carla Mongini-Tamagnini, Angera, both of Italy, and Antoine Settipani, Bagneux, France, assignors to European Atomic Energy Community (Euratom), Kirchberg, Luxembourg

Filed Oct. 27, 1969, Ser. No. 869,752
Claims priority, application Great Britain, Nov. 8, 1968, 53,097/68
Int. Cl. G06c 27/00
U.S. Cl. 235—78 3 Claims

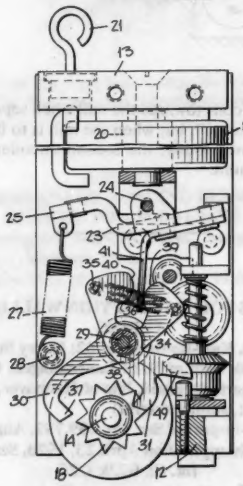
A circular calculator for the solution of radiation penetration problems, the parameters of which are: source indensity *I*, exposure time *T*, thickness *L* of a shield, source-target distance *K* and one of the radiation dose *R* at the target position and a quantity related to the radiation effect *X* on the target, comprising three concentric disks of different radii movable relatively to one another around an axis, two of which disks have each of two scales in opposition associated with the first four parameters *I*, *T*, *L*, *K*, the third disk having a scale associated with one of the two remaining parameters *R* and *X* and carrying an indicator of the *R* scale.

3,700,163

STAR WHEEL OPERATING MECHANISM

George B. Soden, 108 Hickory Lane, Wolcott, Conn.

Filed April 19, 1968, Ser. No. 722,747
Int. Cl. G04b 39/00, 15/00
U.S. Cl. 235—91 M 20 Claims



Bi-acting verge drive means for driving a star wheel with the verge means comprising a pair of pivotally supported pawls engageable with the wheel and mechanical or electrical actuator means operatively connected to at least one of the pawls and spring means connected to the pawls whereby the pawls co-operate to rotate the wheel.

The star wheel is shown adapted to actuate a counter and means is provided for resetting of the counter.

3,700,164

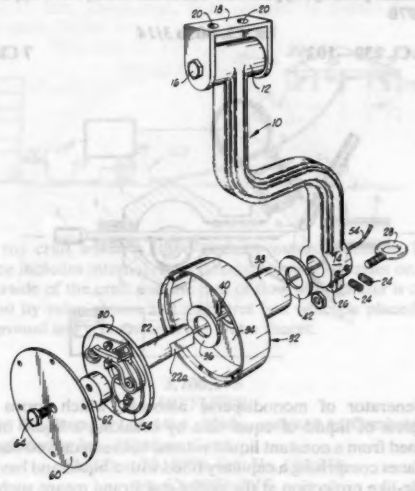
ODOMETER

Rufus L. Slagle, P.O. Box 1327, Panhandle, Tex.

Filed Jan. 19, 1972, Ser. No. 219,104
Int. Cl. G01c 22/00
U.S. Cl. 235—95 R 13 Claims

An odometer which includes a hollow drum having a tubular arm extending normal to one side thereof; a contact-supporting plate having a hollow shaft projecting normal therefrom through the tubular arm; a mounting arm having one end secured to one end of the shaft which is secured at its other end to the contact-supporting plate; a mounting bracket pivotally secured to the other end of the mounting arm; electrical contact points mounted on the contact-supporting plate and adapted for movement between alternate positions for opening and closing an electrical circuit; and eccentric means secured to the drum and rotatable therewith in relation to said contact-supporting plate for periodically actuating said contact points during the revolution of the drum. An electrical lead extends from the contact points through the shaft attached to the contact-supporting plate and forms a portion of

an electrical circuit which includes a switch and a distance indicating meter. Actuating means is connected to the mounting arm for pivoting this arm in the mounting bracket to move the



drum between an operative position in contact with a rotating member, and a non-operative position out of contact therewith.

3,700,165

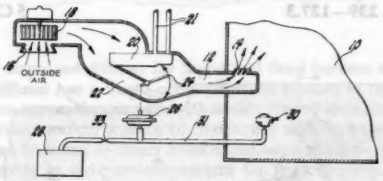
THUMBWHEEL VACUUM THERMOSTAT

Larry A. Beehler, and Jackson R. Templin, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 11, 1971, Ser. No. 105,185

Int. Cl. G05d *23/185*

U.S. Cl. 236—13 **2 Claims**



An automotive air temperature control system including a vacuum regulator which is responsive to the air temperature of the passenger compartment to vary the strength of vacuum applied to a multiposition vacuum motor which is connected to an air damper. The vacuum regulator includes a bleed port with a valve controlled by the combination of a main bimetal element and a compensator bimetal element whose relative response to changes in air temperature is in opposition to one another. The action of the compensator tends to reduce temperature overshoot caused by thermal delay of single bimetal regulators. Cam means connected to a thumbwheel dial are provided for manually setting the vacuum regulator for a range of predetermined temperatures.

3,700,166

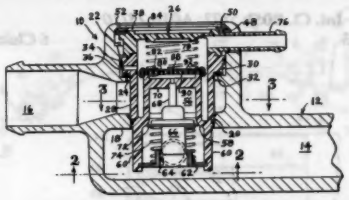
FILLING AND VALVING ASSEMBLY FOR RADIATOR SYSTEM

Jonathan Asa Foults, Wolcott, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Aug. 20, 1971, Ser. No. 173,395

Int. Cl. F01p *7/16*

U.S. Cl. 236—34.5 **3 Claims**



Removable filler cap for pressurized radiator system includes thermostat, pressure escape, vacuum break, and is held in place by a pair of safety locking rings.

3,700,167

RAIL FASTENING ASSEMBLIES FOR RAILROAD TRACKS

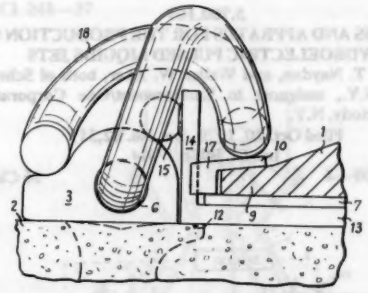
Brian Michael Jennings, Upminster, and John Walter Albert Ager, London, both of England, assignors to Costain Concrete Company Limited, London, England

Filed Oct. 16, 1970, Ser. No. 81,251

Claims priority, application Great Britain, Oct. 17, 1969, 51,227/69

Int. Cl. E01b *9/48*

U.S. Cl. 238—349 **5 Claims**



A rail fastening assembly for fastening rails of a railroad to concrete ties comprises metal shoulders cast directly into a concrete tie during its manufacture on opposite sides of each rail seat and rail clips secured in housings in the shoulders and bearing on the foot of each rail to fasten the rail to the tie. In order to provide for shimming between the rail and the tie to raise the rail and reduce a vertical curve in the track caused by bumps, for example, due to frost-heave, a channel-shaped retainer is slid between the foot of the rail and the tie into a position between the clip retaining shoulders and the shims are located between the foot of the rail and a resilient pad disposed in the bottom of the channel-shaped retainer. Bracing rods are welded to the outside surfaces of the upright walls of the retainer adjacent the top edges and bear on the shoulders to resist outward deflection of the channel side walls. An insulator is interposed between the upright walls of the retainer and the rail foot and has an extension resting on the top of the rail foot underneath the clip.

3,700,168
SPRAY COATING APPARATUS

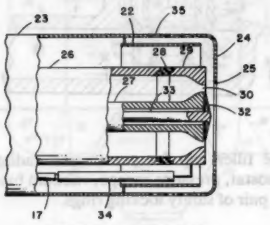
Wolfgang Ferrant, Bozen, Italy, assignor to Ransburg Electro-coating Corp., Indianapolis, Ind.

Division of Ser. No. 826,071, May 12, 1969, Pat. No. 3,606,972, which is a continuation of Ser. No. 632,583, April 21, 1967, abandoned. This application Nov. 9, 1970, Ser. No. 88,232

Claims priority, application Germany, April 28, 1966, P 15 77 737.4; April 28, 1966, P 15 77 738.5; April 28, 1966, P 15 77 739.6

Int. Cl. B05b *5/02*; A01q *23/10*

U.S. Cl. 239—3 6 Claims



An electrostatic, compressed-air spray gun wherein the liquid to be atomized is formed on a conductive support into a film having an extended edge coincident with one edge of a narrow opening through which a high-velocity stream of atomizing air is discharged. The opposite edge of such opening is defined by an electrode between which and the film-support there is maintained an electrical potential difference. The gun may be provided with an insulated spray-surrounding electrode which is maintained at an effective spray-repelling potential by the transmission of ion-borne charges to or from it.

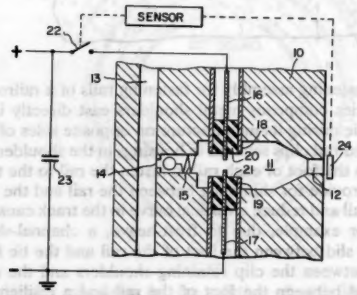
3,700,169
PROCESS AND APPRATUS FOR THE PRODUCTION OF HYDROELECTRIC PULSED LIQUIDS JETS

Theodore T. Naydan, and Walter W. Aker, both of Schenectady, N.Y., assignors to Environment/One Corporation, Schenectady, N.Y.

Filed Oct. 20, 1970, Ser. No. 82,319

Int. Cl. B05b *17/04*

U.S. Cl. 239—4 16 Claims



Process and apparatus for producing high energy pulsed liquid jets by the discharge of electrical energy through a relatively incompressible liquid in an essentially closed chamber having a shaped outlet nozzle.

3,700,170
GENERATOR OF MONODISPERSE AEROSOLS

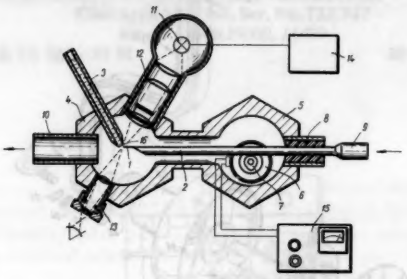
Dohnalova-Binkova Blanka, and Bedrich Binek, both of Plzen, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Praha, Czechoslovakia

Filed June 2, 1971, Ser. No. 149,292

Claims priority, application Czechoslovakia, Nov. 18, 1970, 779970

Int. Cl. B05b *3/14*

U.S. Cl. 239—102 7 Claims



Generator of monodisperse aerosols, which forms fine droplets of liquid of equal size by breaking a liquid bridge formed from a constant liquid volume between curved contact surfaces comprising a capillary filled with a liquid and having a blade-like projection at the outlet end strand means such as a wire or fiber of which one extremity is attached to an oscillatory or vibrating means or device having a cylindrical portion at the one extremity thereof and which is arranged so as to be located in the dead center of the extreme limits of oscillations, the strand means being a contact with the blade-like projection of the capillary and with the surface level of the liquid in the capillary, and means for directing a supply of a gaseous phase for breaking the liquid bridge located substantially perpendicular to that of the strand motion.

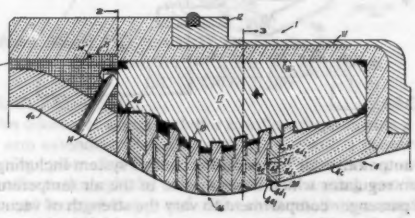
3,700,171
COOLING TECHNIQUES FOR HIGH TEMPERATURE ENGINES AND OTHER COMPONENTS

Arthur R. Parilla, 34 Crestview Road, Mountain Lakes, N.J.

Continuation of Ser. No. 588,779, Oct. 24, 1966, abandoned, which is a division of Ser. No. 273,265, April 12, 1963, Pat. No. 3,305,178. This application June 26, 1969, Ser. No. 842,774

Int. Cl. B64d *33/04*

U.S. Cl. 239—127.3 5 Claims



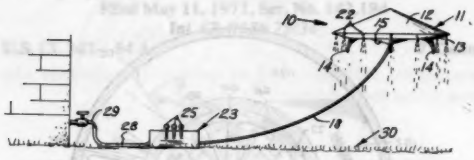
Cooling means for a rocket engine nozzle comprising a fusible multi-turn, multi-layer coil of metal surrounding a porous liner in the nozzle and flowing therethrough when melted. Gas bled from the thrust chamber of the rocket engine forces the melted metal coolant through the nozzle liner, the pores of the liner directionally dispersing the coolant over the nozzle liner surface.

3,700,172

REACTION POWERED TOY FLYING CRAFT

James P. Gallegos, Sr., 10553 Greenway, El Paso, Tex.

Filed Sept. 9, 1971, Ser. No. 178,946
Int. Cl. B05b 3/00
U.S. Cl. 239—188 **3 Claims**



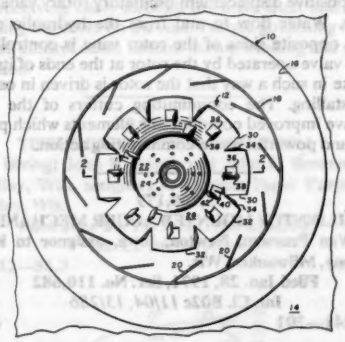
A toy craft which is lifted aloft by water jet means. This device includes internal tubes directed to spray nozzles on the underside of the craft and the rate of flow of the water is controlled by valve means and a control box which is placed on the ground and is connected to a water faucet.

3,700,173

DIFFUSER

Elmer Ketchum, Jr., Pontiac, Mich., assignor to Combustion Engineering Inc., Windsor, Conn.

Filed Dec. 30, 1970, Ser. No. 102,810
Int. Cl. B05b 7/10
U.S. Cl. 239—405 **7 Claims**



An improved diffuser for liquid fuel fired burners wherein the diffuser has a frusto-conical surface located in the combustion-supporting air path with widely spaced slots formed in the frusto-conical surface to divide the surface into several distinct frustums to direct combustion-supporting air into the fuel spray as independent streams for the complete mixing thereof. The tabs from which the slots are formed are bent forward at substantially an 80° angle with respect to the frusto-conical surface to direct the air streams into the fuel spray in a tangential manner.

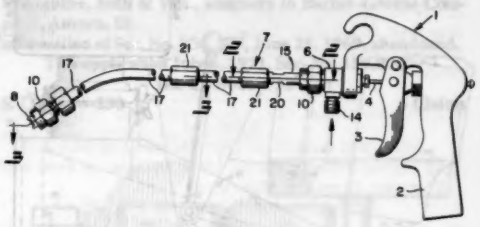
3,700,174

AIRLESS SPRAY GUN EXTENSION

Louis Beck, 6399 Crossview Road, Seven Hills, Ohio

Filed April 5, 1971, Ser. No. 130,957
Int. Cl. B05b 11/00
U.S. Cl. 239—526 **8 Claims**

An extension for an airless paint spray gun of the type wherein a flanged spray nozzle or tip is clamped to the gun body by means of a cap having threaded engagement with the spray gun body, the extension being characterized in that a flanged fitting at one end is thus clamped to the spray gun body by means of the cap aforesaid, and in that a fitting at the other end has the spray nozzle clamped thereto by another cap which is the same as the cap which threads onto the spray gun body. Between the fittings aforesaid the extension includes one or more tubular sections which are coupled to each other and to the end fittings to define an extension assembly having a smooth wall bore without pockets or radial enlargements. The extension assembly is further characterized in that the fittings and tubular sections are of thick wall construction so as to substantially avoid radial and lineal expansion even under very high paint spray pressures.

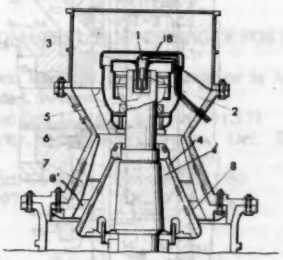


3,700,175

GAP CONTROLLING DEVICE FOR A CONE CRUSHER

Hisatuna Saito, Hibarigaoka Danchi 2-206, Kurume-machi, Tokyo, Japan

Filed Aug. 5, 1970, Ser. No. 61,078
Int. Cl. B02c 25/00
U.S. Cl. 241—37 **4 Claims**



Apparatus is disclosed for controlling the outlet gap of a cone crusher, comprising a detecting core disposed within a main shaft of the cone crusher and a plurality of coils fixedly disposed with respect to the detecting core and forming therewith a differential transformer. A suitable electrical circuit is associated with the differential transformer to develop an electrical signal to be applied to a suitable measuring means such as a meter for providing an indication of the size of the outlet gap. In an illustrative embodiment of this invention, the measuring means is adapted to control the vertical movement of the main shaft of the cone crusher to adjust the outlet gap, thus enabling minerals to be crushed to a predetermined size.

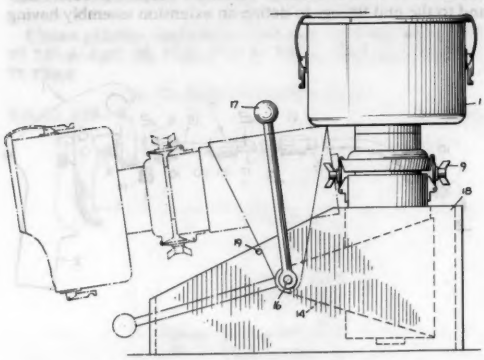
3,700,176

TILTABLE GRINDER-BLENDER,

Norman Haber, Old Tappan, N.J., assignor to Haber Instruments, Inc., Palisades Park, N.J.

Filed Dec. 14, 1970, Ser. No. 97,879

U.S. Cl. 241—27 2 Claims



This disclosure is directed to a grinder blender having a bowl with a blade member therein which rotates at a high speed. A means is provided to tilt the bowl to increase the effectiveness of the grinding or blending operation.

3,700,177

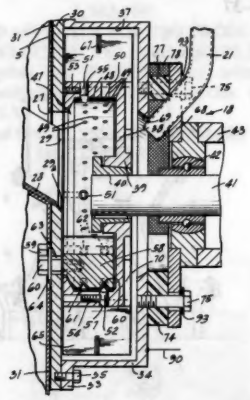
COMMINUTING APPARATUS

William S. Pearson, Hampstead, Md., assignor to Cypro-Incorporated, Hampstead, Md.

Division of Ser. No. 808,250, March 18, 1969, Pat. No. 3,617,005. This application May 13, 1971, Ser. No. 142,928

Int. Cl. B02c *13/08*

U.S. Cl. 241—36 17 Claims



Comminuting apparatus includes a grinding drum, means for rotating the drum, grinding teeth mounted within the drum and a stationary grinding device extending into the drum and having complementary grinding surfaces coactive with the teeth. The drum is in the form of a rotor having a perforated peripheral wall through which comminuted material is centrifugally displaced into a chamber about the same, with impeller means on the rotor about the periphery thereof for creating a suction of air outwardly from within the rotor in the comminuting rotation of the rotor. Means are provided for automatically stopping the rotor when a foreign metal particle lodges across a gap between conductive surfaces connected to the rotor and the housing.

3,700,178

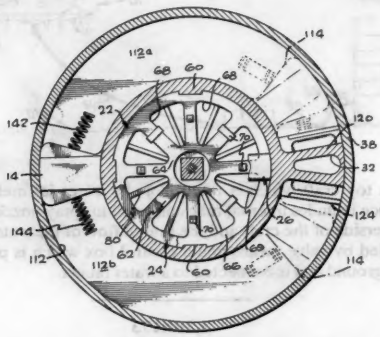
HYDRAULICALLY POWERED WASTE DISPOSAL DEVICE

Donald J. Verley, 4444 Sunnycrest Drive, Los Angeles, Calif.

Filed Feb. 6, 1970, Ser. No. 9,192

Int. Cl. B02c *18/42*

U.S. Cl. 241—46 B 7 Claims



A waste disposal device having a comminuting chamber containing comminuting means powered by a hydraulic motor. Water efflux from the motor enters the chamber to aid passage of waste through the chamber. The disclosed comminuting means embodies a fixed comminuting member and a coacting oscillatory comminuting member driven in oscillation by a positive displacement oscillatory rotary vane hydraulic motor. Water flow to and from the hydraulic chamber spaces at opposite sides of the rotor vane is controlled by a reversing valve operated by the rotor at the ends of its oscillatory stroke in such a way that the rotor is driven in oscillation without stalling. The comminuting cutters of the disposal device have improved comminuting elements which provide a superior and powerful waste comminuting action.

3,700,179

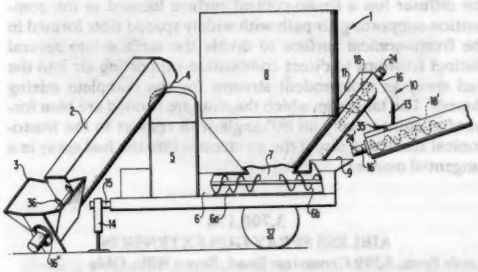
RESILIENTLY MOUNTED AUGER MECHANISM

Marvin Van Peursem, Newton, Iowa, assignor to Koehring Company, Milwaukee, Wis.

Filed Jan. 28, 1971, Ser. No. 110,682

Int. Cl. B02c *11/04*, *13/286*

U.S. Cl. 241—301 4 Claims



A farm mechanism including an auger-type feeder, at least a portion of which is yieldably supported by a diaphragm-mounted motor.

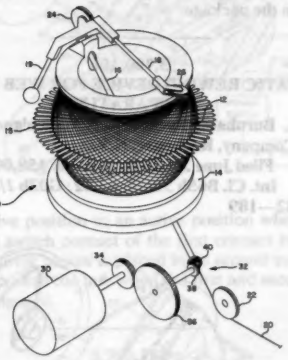
ERRATUM

For Class 241—230 see:
Patent No. 3,700,182

3,700,180
CABLE WINDING APPARATUS

Tilbert C. Sitz, Richardson, Tex., assignor to Collins Radio Company, Dallas, Tex.

Filed May 11, 1971, Ser. No. 142,194
Int. Cl. B65h *75/34*
U.S. Cl. 242—54 A 7 Claims

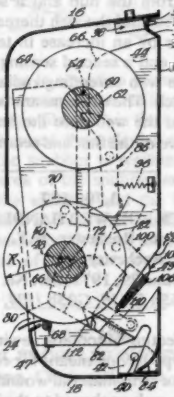


Apparatus for winding cable and the like including a spherically shaped reel, a hollow drive shaft extending through said reel, and a winding arm fastened to a free end of the drive shaft for receiving cable through the drive shaft and winding or unwinding the cable on the reel. Torque governing means is provided to control cable tension during winding and unwinding operation.

3,700,181
TISSUE DISPENSING MECHANISM

James A. Diring; John B. Engel, and John E. Broeren, all of Green Bay, Wis., assignors to Mosinee Paper Corporation, Green Bay, Wis.

Filed June 24, 1971, Ser. No. 156,300
Int. Cl. B65h *19/04*
U.S. Cl. 242—55.3 10 Claims

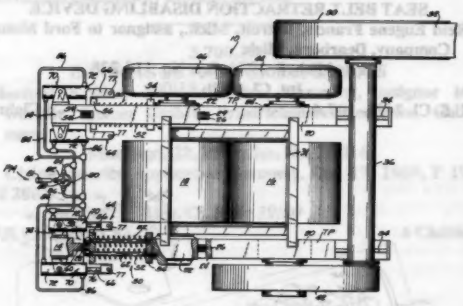


A dispenser for toilet tissue or the like includes a tamper proof enclosure that contains a roll carrying track leading downward and forward from a reserve position to a dispensing position. The track then leads rearward and downward to a storage area for depleted rolls. Automatic refill at the dispensing position is accomplished by pushing the depleted roll into the storage area, and means are provided to prevent excessive movement of the roll in dispensing position until the roll has been entirely depleted.

3,700,182
HYDRAULIC ADJUSTMENT MEANS FOR ROLL CRUSHING APPARATUS

Ronald B. Dediemar, Brown Deer, and LeRoy J. Schuman, Milwaukee, both of Wis., assignors to Barber-Greene Company, Aurora, Ill.

Continuation of Ser. No. 836,389, June 25, 1969, abandoned.
This application July 6, 1971, Ser. No. 159,876
Int. Cl. B02c *4/32*
U.S. Cl. 241—230 5 Claims

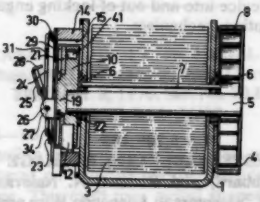


A roll crushing apparatus of the type in which the crushing action takes place between a pair of parallel, spaced apart, rotating rolls, one of which is fixed on the crusher frame while the other roll is movable on the frame to thereby adjust the gap between the rolls. A roll adjusting assembly is provided for positioning the movable roll relative to the other roll, and this assembly includes spring means having a U-shaped bracket embracing spring means, the bracket in turn being positionable by double acting hydraulic rams. The arrangement of the parts is such that the overall length of the crusher can be shortened.

3,700,183
NOVEL AUTOMATIC LOCKING DEVICE FOR SAFETY BELTS

Gert Ingmar Rex, Hamstad, Sweden, assignor to AB Autoindustri, Halmstad, Sweden

Filed Oct. 21, 1971, Ser. No. 191,171
Claims priority, application Sweden, Oct. 27, 1970, 14490/70
Int. Cl. B65h *75/48*; A62b *35/60*
U.S. Cl. 242—107.4 3 Claims



An automatic locking device for a safety belt for retaining a person in a vehicle comprising a rotor shaft rotatable in a casing for reeling up the belt and a rotor rotatable together with the shaft and means to lock the rotor to the casing in response to centripetal forces produced by withdrawal of the belt. The

device includes a two-armed locking member mounted on a horizontal shaft carried by a cover plate substantially transversally to the shaft of the rotor and adapted on acceleration or deceleration forces exceeding a predetermined value actuate a swingable element which is suspended pivotably relatively to said cover plate to take a position releasing the means locking the rotor relative the casing. By mounting the swingable element at an upper point freely pivotable on the cover plate and forming it on both sides of one arm of the two-armed locking member with cam surfaces, the force necessary for actuating the swingable element is reduced and the weight of the locking device is a reduced weight and its reactivity and reliability is improved. In addition the two-armed locking member can be mounted on a shaft extending in other than the horizontal direction.

3,700,184

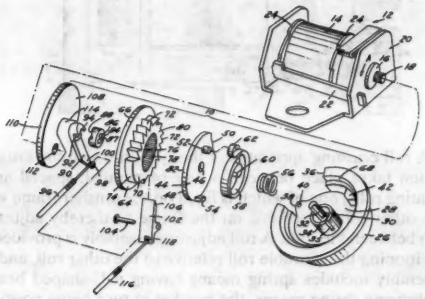
SEAT BELT RETRACTION DISABLING DEVICE

Reid Eugene Francis, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 8, 1971, Ser. No. 113,228

Int. Cl. A62b *35/00*

U.S. Cl. 242—107.4 **6 Claims**



A device is described for disabling the retraction of an automatically retracted seat belt. The retraction device has a shaft, about which the seat belt is wound, which has gear teeth formed on an exposed free end thereof. The disabling device includes a position locating mechanism which is driven to various positions by the shaft's gear teeth as the seat belt is unwound from the shaft. A locking device is engageable with the position locating mechanism in order to lock the mechanism and the belt shaft in a fixed position associated with the extension of a predetermined belt length. A cam controlled device is also provided which controls whether the locking device operates to lock the position locating mechanism in the fixed position. Operating mechanism is also provided which operates in conjunction with the cam controlled device to selectively actuate the same thereby to control the movement of the locking device into and out of locking engagement with the position locating mechanism.

3,700,185

DISPENSABLE COIL PACKAGE

Ronald R. Hubbard, and Richard N. Nalevanko, both of Orange, Calif., assignors to Anaconda Wire and Cable Company

Filed Feb. 17, 1970, Ser. No. 11,997

Int. Cl. B65h *55/02, 49/00*

U.S. Cl. 242—159 **1 Claim**

A shipping and dispensing package comprising coils comprising a plurality of radial layers, each layer comprising a helical winding of insulated wire or other strand and a thin-walled, stretchable, polymeric membrane enclosing and compressing the coils and having an aperture for pulling the wire from within the package.

3,700,186

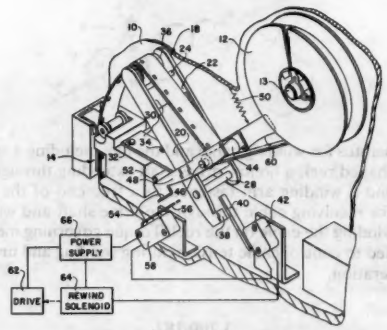
AUTOMATIC REWIND DEVICE FOR WEB HANDLING APPARATUS

William L. Burnham, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 29, 1971, Ser. No. 158,001

Int. Cl. B65h *59/38, 63/02*; G03b *1/04*

U.S. Cl. 242—189 **7 Claims**



A device for effecting automatic rewind in a web handling apparatus of the type having means for rotatably supporting a hub having a web of strip material wound thereon with the innermost end of the web anchored to the hub so that at least a portion of the web extends substantially radially from the hub when the web has been completely unwound therefrom. The device includes drive means having a first condition for unwinding the web from the hub and a second condition for rotating the hub to rewind the web thereabout. A first sensing means is actuatable by an increase in tension of the web to close a first switch and a second sensing means is actuatable by a portion of the web extending radially from the core to close a second switch. The drive means is placed in its second condition to rewind the web onto the hub in response to the simultaneous closure of the first and second switches.

3,700,187

REWIND DEVICE FOR WEB HANDLING APPARATUS

Kenneth W. Thomson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

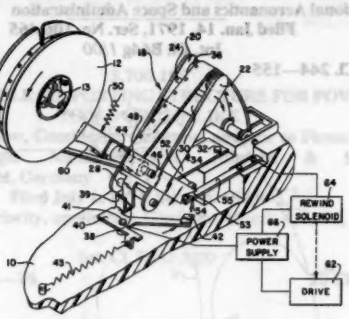
Filed June 29, 1971, Ser. No. 158,035

Int. Cl. B65h *59/38*; G03b *1/04*; G11b *15/32*

U.S. Cl. 242—190 **6 Claims**

A device for effecting automatic rewind in a web handling apparatus of the type having means for rotatably supporting a hub having a web of strip material wound thereon with the innermost end of the web anchored to the hub so that at least a portion of the web extends substantially radially from the hub when the web has been completely unwound therefrom includes drive means having a first condition for unwinding the web from the hub and a second condition for rotating the hub

to rewind the web thereabout. A first sensing means is actuatable by an increase in tension of the web to move a switch contact from an inactive position to an active position, and a second sensing means is actuatable by a portion of the web extending radially from the hub to move a second switch contact



from an inactive position to an active position whereat it engages the first switch contact of the first contact in its active position. The drive means is placed in its second condition to rewind the web onto the hub when the first and second switch contacts are engaged.

3,700,188

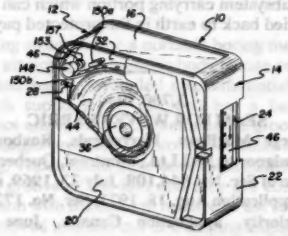
FLEX-SNUBBER

James C. Bradford; Stephen H. Miller, and Jeffrey C. Robertson, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 24, 1971, Ser. No. 201,825

Int. Cl. G03b *1/04*; G11b *15/32*

U.S. Cl. 242—194 **11 Claims**



In a cartridge for use in a motion picture camera, a frustoconical snubber is mounted on a resilient, deflectable stem and is positioned along a film path in the cartridge. As the film is intermittently advanced through the cartridge in contact with the snubber, the snubber is resiliently deflected to increase the surface area of the snubber engaged by the film. The deflection of the snubber and the increased frictional forces between the film and snubber resulting therefrom dampen variations in tension forces along the film permitting more accurate registration of the film for recording of images thereon.

3,700,189

VTOL PROPULSION SYSTEM

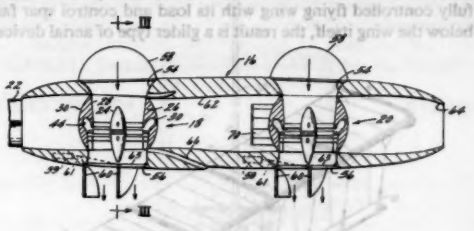
Eugene L. Timperman, Cincinnati, Ohio, assignor to General Electric Company

Filed July 2, 1970, Ser. No. 51,923

Int. Cl. B64c *15/00, 29/00*

U.S. Cl. 244—12 **8 Claims**

A propulsion system is described which comprises two tip-turbine driven fan units pivotally mounted in a pod. For vertical propulsion the units are respectively registered with vertically aligned inlet and discharge ports in the pod. For forward



propulsion the units are swung into registration with a horizontal passageway through the pod.

3,700,190

DAMPING DEVICE FOR SATELLITES

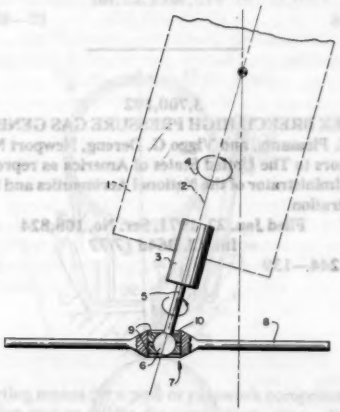
Manfred Kubler, Friedrichshafen, Germany, assignor to Dornier System GmbH, Friedrichshafen/Bodensee, Germany

Filed Sept. 22, 1970, Ser. No. 74,316

Claims priority, application Germany, Oct. 17, 1969, P 19 52 280.6

Int. Cl. B64c *39/00*

U.S. Cl. 244—1 SA **6 Claims**



This invention relates to an apparatus for damping the nutational movements on satellites comprising motor means mounted on the satellite housing, and flywheel means mounted on the motor shaft in a universally movable manner.

3,700,191

PARASAIL, GLIDER TYPE AERIAL DEVICE

Patrick E. Page, 393 Cronin Drive, Santa Clara, Calif.

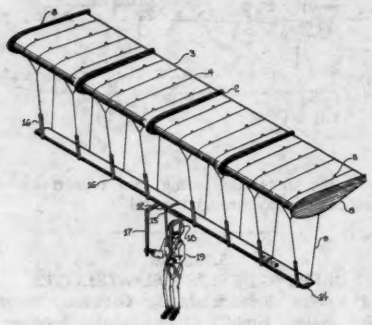
Filed Sept. 8, 1970, Ser. No. 70,009

Int. Cl. B64c *31/02*

U.S. Cl. 244—16 **3 Claims**

The parasail, a glider type aerial device, uses aeronautical principles found on conventional parachutes and sailplanes, thus its name. This craft uses airfoil shaped flying surfaces connected, via a multiplicity of shroud lines, to an external load and control carrying spar and its payload. The wings fly above the spars in a similar manner as a parachute canopy does above its payload. These wings are split at their center to provide angle of attack changes independently from each other. The pilot actuates a set of independently moving spars, using two control levers, that in turn change the angle of at-

tack of the wings using a multiplicity of shroud lines as a transmittal medium. This allows the change to the speed, lift coefficients and direction of travel of the Parasail. By the use of a fully controlled flying wing with its load and control spar far below the wing itself, the result is a glider type of aerial device



with a very low center of gravity with great in flight stability. Due to its structural simplicity, flight stability, ease of operation, low cost of manufacturing and operation, a soaring craft is obtained, that has many desirable features for its intended purpose as a sporting aerial machine.

3,700,192

VORTEX BREECH HIGH PRESSURE GAS GENERATOR

James E. Pleasants, and Viggo G. Dereng, Newport News, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Jan. 22, 1971, Ser. No. 108,824

Int. Cl. B64d *17/72*

U.S. Cl. 244—139 **14 Claims**

A high pressure gas generator for ejecting parachutes or the like where propellant free gases are essential to prevent damage to the ejected article and employing a vortex breech to separate unburned propellant particles from the hot high pressure gases.

3,700,193

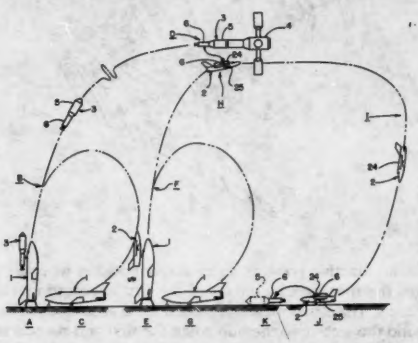
A METHOD OF DELIVERING A VEHICLE TO EARTH ORBIT AND RETURNING THE REUSABLE PORTION THEREOF TO EARTH

Raymond H. Bradley, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Jan. 14, 1971, Ser. No. 106,465

Int. Cl. B64g *1/00*

U.S. Cl. 244—155 **1 Claim**



The present invention relates to a space shuttle system for delivering payload to earth orbit or other celestial orbit comprising a specially designed stage to be used with the orbiter and booster of the space shuttle. The booster can carry either the orbiter or the stage to a sub-orbital staging point. Both the orbiter and the stage are capable of proceeding from such a staging point to celestial orbit carrying a payload. The orbiter, having re-entry equipment, is capable of re-entering the earth's atmosphere and landing on earth. The orbiter has a re-entry environment protected bay in which its payload can be carried. The stage, being independent of re-entry equipment, has a large payload carrying compartment and a smaller, detachable subsystem carrying portion which can be received into and carried back to earth in the protected payload bay of the orbiter.

3,700,194

SEAM FOR WOVEN FABRIC

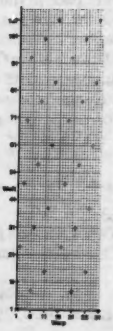
Donald George MacBean, Pierrefonds, Roxboro, Quebec, Canada, assignor to JWI Ltd., Montreal, Quebec, Canada

Continuation of Ser. No. 844,108, July 23, 1969, abandoned. This application Aug. 18, 1971, Ser. No. 172,864

Claims priority, application Canada, June 13, 1969, 054,348

Int. Cl. B21f *27/10*

U.S. Cl. 245—10 **1 Claim**



A seam for an endless woven fabric wherein end portions of weft strands project from the ends of the fabric and are woven

together in the seam with a plurality of added warp strands so that the warp end portions projecting from one end of the fabric and those from the other end of the fabric to be joined meet at a termination point and these termination points are both laterally and longitudinally spaced from one another.

3,700,195

ADJUSTABLE SUPPORTING STRUCTURE FOR POWER TOOLS OR THE LIKE

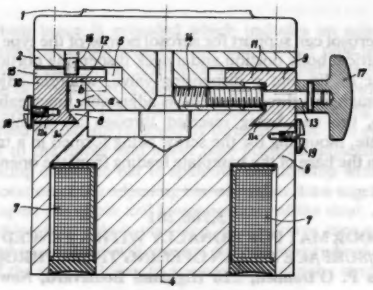
Lothar Pahlow, Geesthacht, Germany, assignor to Firma Wilhelmsburger Maschinenfabrik, Hinrichs & Sohn, Geesthacht, Germany

Filed July 1, 1971, Ser. No. 158,871

Claims priority, application Germany, March 4, 1971, P 21 10 239.6

Int. Cl. E21c *5/00*

U.S. Cl. 248—16 **10 Claims**



A supporting structure for a portable boring machine has a foot which is attracted to a metallic body by one or more electromagnets and has a dovetailed circumferential groove. A column which supports the machine has a base abutting against the foot and having a circumferential groove for complementary flanges provided on two semicircular sections of a clamping ring. The sections have dovetailed flanges which extend into the groove of the foot and they are coupled to the base for rotation with the column relative to the foot. The sections can be moved into and out of clamping engagement with the foot and with the base, and the width of those flanges which extend into the groove of the base exceeds the depth of such groove to permit sidewise adjustments of the column when the clamping action is relaxed or terminated. The column is then also free to rotate about its own axis but through less than a full revolution. Sidewise adjustments of the column are effected by a spindle which is rotatable in one of the sections and extends radially of the column into a tapped bore of the base, or by a pinion which is rotatable with a shaft mounted in one of the sections and meshes with a radially extending rack of the base. The spindle and the internal threads of the bore or the pinion and the rack furnish a self-locking action so that the column can be moved sideways only when the spindle or the pinion is caused to rotate.

3,700,196

FLAG STAFF ANCHOR

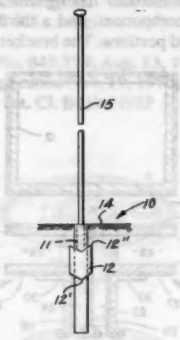
Arthur E. Hall, 157 West Lorenzo Avenue, Norfolk, Va.

Filed March 19, 1971, Ser. No. 126,000

Int. Cl. F16m *13/00*

U.S. Cl. 248—44 **1 Claim**

A device for supporting a flag staff. This device includes a sleeve with a stabilizing plate attached thereto which will enable it to remain permanently in the ground, the sleeve portion receiving the flag staff which is removable therefrom.



3,700,197

PIPE SUPPORTING MEANS

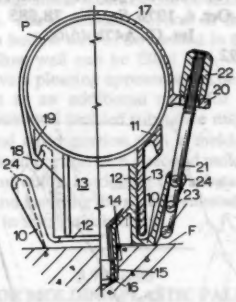
Eric Sidney Branton, Romford, England, assignor to Activated Sludge Limited, London, England

Filed Sept. 1, 1970, Ser. No. 68,608

Claims priority, application Great Britain, Sept. 30, 1969, 47,878/69

Int. Cl. F16l *3/14*

U.S. Cl. 248—71 **6 Claims**



A supporting means for a pipe or pipework comprises a base part, a seating-part or saddle, for supporting a pipe, adjustably mounted on said base part so that the height or length of the supporting means can be varied, a strap or the like adapted to embrace or bear on said pipe to hold it onto the seating part or saddle and a screw threaded bolt for tightening said strap or the like about or against said pipe, said bolt having an anchoring arrangement which provides for alteration in the effective length of the bolt according to the adjustment of the seating-part or saddle on the base part. In one preferred embodiment of the invention the bolt has two, three or more head-like parts spaced along its length any one of which can be anchored to an anchorage on the base part, and the strap has a hooked part which hooks onto a hook-like member provided on the saddle.

3,700,198

MOUNTING BRACKET ASSEMBLY FOR AIR CONDITIONING SYSTEMS

August W. Gutheim, Chittenango, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

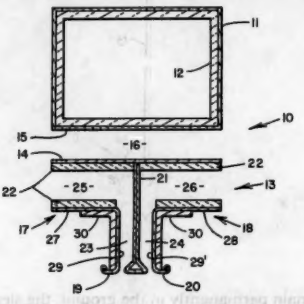
Filed May 3, 1971, Ser. No. 139,491

Int. Cl. F16b *1/00*

U.S. Cl. 248—214 **6 Claims**

A bracket assembly for mounting a component of an air

conditioning system to a frame member of the ceiling of an area being served by the system. The bracket assembly includes a U-shaped member having first and second portions for engaging the component, and a third portion connecting the first and second portions. The bracket assembly further in-



cludes a hanger portion for engaging a first section of the frame member. An edge of the hanger portion extends a predetermined distance beneath an edge of the third portion of said U-shaped member. The respective edges define the lowest vertical surface of the U-shaped member and the lowest vertical surface of the hanger portion.

3,700,199

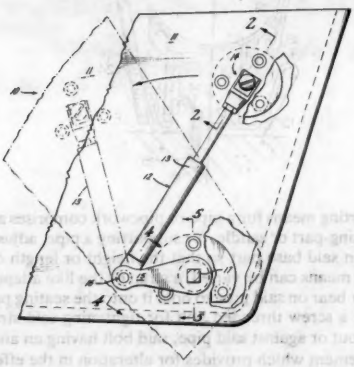
QUICKLY REMOVABLE, PIVOTAL, AND SNUBBED STORAGE BIN

James E. Matuska, 641 West Ewing, Seattle, Wash.

Division of Ser. No. 744,933, July 15, 1968. This application Oct. 6, 1970, Ser. No. 78,585

Int. Cl. A47b *46/00*

U.S. Cl. 248—292 **4 Claims**



An easily and quickly removable, pivotal, and snubbed storage bin, such as but not limited to aircraft passenger carry-on luggage having axially retractable pivotal pins extendible from the bin into recesses in support structure, such as but not limited to an aircraft passenger transport, in a nonrotatable fitting and a snubber pivotally connected between the bin and the pin for snubbing relative movement between the bin and its pivot pin and accordingly between the bin and the support structure.

Also incorporated in the quickly removable pivotal rigid structure is a quickly retractable and snubbing pivot pin mechanism comprising an extendible means, snubbing means, and link means nonrotatably and slideably connected to the extendible bin means and pivotally connected to the snubbing means.

3,700,200

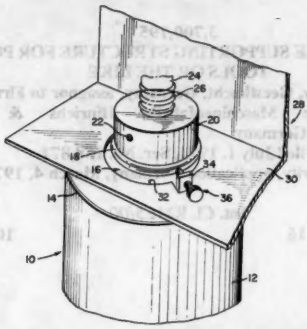
ADJUSTABLE AEROSOL CAN SUPPORT

Gordon S. Batchelor, Portsmouth, and Dalbro R. Nixon, Chesapeake, both of Va., assignors to Virginia Chemicals Inc., Portsmouth, Va.

Filed Jan. 20, 1971, Ser. No. 108,122

Int. Cl. A61m *27/00*

U.S. Cl. 248—312 **1 Claim**



An aerosol can support for aerosol bombs of the type having a cylindrical body portion and a neck dispensing portion with a collar or lip and a dispensing valve, wherein adjustable means such as a threaded screw is adjustably engageable with the lip, the can being inserted through an opening in a baseplate, mounting for the screw being formed in a tab bent up from the base of the baseplate leading from the opening.

3,700,201

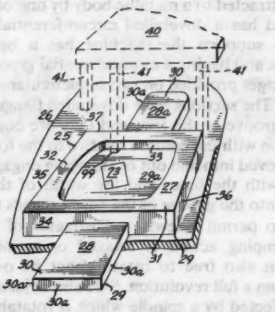
FLOOR MAT PORTIONALLY WITH A FENCED IN TOP/SURFACE AND AN OPENING THERETHROUGH

Thomas P. O'Donnell, 220 Highland Boulevard, New York, N.Y.

Filed Feb. 20, 1970, Ser. No. 13,150

Int. Cl. B65d *19/38*

U.S. Cl. 248—346 **6 Claims**



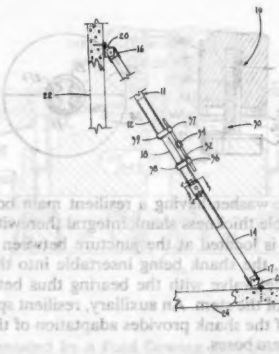
A floor mat, with or/and without a foot-rest-and-pressable leaf abutting therefrom, and firstly comprising a fence abutting upwardly therefrom for partly or fully fencing in a top surface portion thereof, for a first purpose, of simultaneously fencing in swivelling wheels of a swivel chair on said top surface portion, and secondly comprising a propable opening portion, for a second purpose, of surrounding a prop penetrated therein and being otherwise attached with a portion of a floor, for anchoring said floor mat on a said floor. And thirdly comprising a bottom surface, or a portion of a bottom surface of a floor mat, and/or its leaf when present, and/or a prop, can be made from a self adhering material for adhering and anchoring a said floor mat with a said floor. When a floor mat comprises a said leaf, said leaf can comprise a said propable opening portion, for a said second purpose.

3,700,202

ADJUSTABLE BRACE FOR TILT-UP CONSTRUCTION

Wayne T. Donnels, Reno, Nev., assignor to The Walker Boudwin Construction Co., Inc., Reno, Nev.

Filed June 29, 1970, Ser. No. 50,505
Int. Cl. E04g 25/06
U.S. Cl. 248—354 C 3 Claims



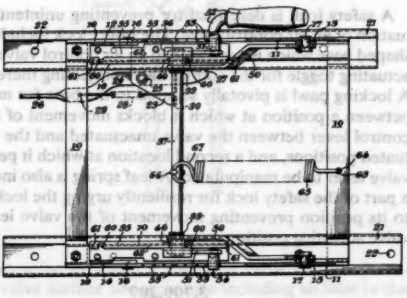
A tilt-up brace is provided which includes an adjustable strut having an upper pipe portion and a lower pipe portion. Partially engaged within and welded to the upper pipe portion is a pipe of smaller cross section which is received within the lower pipe portion. The ends of an adjusting bar having halves of reversed thread are received by threaded eyes. The eyes are secured to the upper and lower pipe portions adjacent their confronting ends, the bar in spanning relationship with these ends. Rotation of the adjusting bar will either draw together or spread apart the upper and lower portions of the strut. A friction locking assembly is provided on the lower pipe portion which when engaged will prevent further longitudinal movement of the pipes relative to one another once the strut is adjusted.

3,700,203

VEHICLE SEAT SUPPORT

Albert John Adams, 3, Richmond Way, Fetcham, England

Filed Feb. 5, 1971, Ser. No. 113,005
Int. Cl. B60n 1/02
U.S. Cl. 248—419 6 Claims



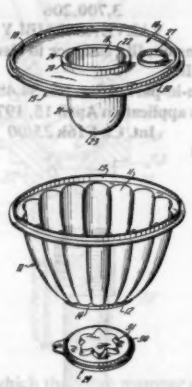
A vehicle seat support in which a single tension spring performs the functions previously performed, in one known construction of vehicle seat support, by a tension spring and two coiled springs, namely, control of the elevation of a seat frame assembly relative to a floor frame assembly and operation of a catch mechanism to maintain a chosen elevation setting of the seat frame assembly.

3,700,204

MOLD FOR INGESTIBLE SUBSTANCES

James B. Swett, Barrington, and Harold P. Ashton, Providence, both of R.I., assignors to Dart Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 849,779, Aug. 13, 1969, Pat. No. 3,576,113. This application Nov. 19, 1970, Ser. No. 91,147
Int. Cl. B41b 11/62
U.S. Cl. 249—104 6 Claims



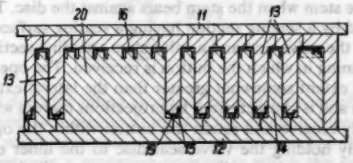
A reusable molding kit and method of molding ingestible substances. The kit comprises a central mold portion and a multiple seal closure having a depressed portion which is inwardly directed. The central mold portion has smaller and larger end openings either of which can be sealed by the multiple seal closure. The depressed portion in the multiple seal closure causes a hollow well to be formed in the molded substance. The hollow well can be filled with various different substances to give a pleasing appearance. The depressed portion also serves as an additional mold for ingestible substances. A multicolored molded substance may be formed by filling the central mold portion with a moldable substance, filling the depressed portion with a second moldable substance having a different color, hardening the substances, removing the substances and inserting the second substance into the hollow well formed in the first substance.

3,700,205

DIE FOR MOLDING PLASTIC PALLETS

Ernst Ditges, Herzebrock, Westfalen, Germany, assignor to Press-Und Stanzwerk Paul Craemer KG, Herzebrock, (Westfalen), Germany

Division of Ser. No. 785,812, Dec. 20, 1968, Pat. No. 3,603,272. This application Feb. 8, 1971, Ser. No. 113,235
Claims priority, application Germany, Dec. 20, 1967, P 15 56 151.0
Int. Cl. B28b 7/16
U.S. Cl. 249—142 6 Claims



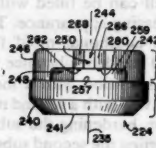
A two part die for injection molding an integral plastic pallet having a load carrying top portion and a supporting bottom portion each formed by transversely spaced ribs of U-shaped cross section, the die comprising two die sections having each a plurality of spaced webs tapering toward free ends thereof

and arranged with respect to each other so that when the die is closed the webs of one section will intermesh and engage without play plane side faces of the other section and so that at the free ends of the webs hollow spaces of U-shaped cross sections are formed for molding the U-shaped ribs.

3,700,206
VALVE ASSEMBLY

Evan Jones, Evanston, Ill., assignor to Henry Valve Company, Melrose Park, Ill.

Continuation-in-part of Ser. No. 34,483, May 4, 1970, abandoned. This application April 15, 1971, Ser. No. 134,336
Int. Cl. F16k *25/00*
U.S. Cl. 251—84 **6 Claims**

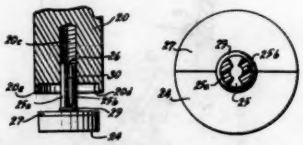


The valve assembly includes an integral member or molded part which serves as a one-piece valve seat disc and which is mounted on a metal valve stem received in a valve body and arranged for movement along an axis essentially coaxial with the axis of a valve seat at the entrance to a passage within the valve body. The valve stem has a button at its inner end for mounting the valve seat disc and is rotatably reciprocal in the valve body for moving the valve seat disc to and from the valve seat. The valve seat disc is made from a material which is stiff, but resilient, and which has a low coefficient of friction with respect to metal to permit relative rotation between the disc and the stem when the stem bears against the disc. The disc is defined by a seating section having a seating surface for seating on the valve seat and a valve stem coupling section having an opening in which the button is received. The opening has a lateral extent somewhat greater than the lateral extent of the button and is characterized by projections therein which snap-fittingly receive and retain the button within the opening for securely holding the valve seat disc to the inner end of the valve stem and yet allowing it to move a limited distance laterally of the axis of the valve stem so that the disc will properly seat itself on, and align itself with respect to, the valve seat. In one embodiment, the projections have axially extending protuberances thereon which bear against the underside of the button to firmly hold the disc against axial movement thereof relative to the stem.

3,700,207
WASHER REPLACEMENT ASSEMBLY FOR FAUCET VALVES

Joseph E. Bartlett, 215 South Parker Avenue, Highway 7, Olathe, Kans.

Filed July 23, 1970, Ser. No. 57,691
Int. Cl. F16k *25/00*
U.S. Cl. 251—88 **7 Claims**

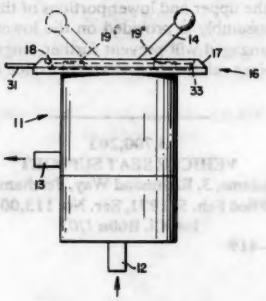


A nonmetallic washer having a resilient main body and a bifurcated variable thickness shank integral therewith. A frictionless bearing is located at the juncture between the main body and shank, the shank being insertable into the central bore of the faucet valve with the bearing thus between the washer and end of the stem. An auxiliary, resilient spacer held within the slot of the shank provides adaptation of the washer to various size stem bores.

3,700,208
AIR VALVE SAFETY LOCK

John Hanan, 912 Versailles Avenue, Alameda, Calif.

Filed June 30, 1971, Ser. No. 158,267
Int. Cl. F16k *35/00*
U.S. Cl. 251—90 **8 Claims**



A safety lock is described for preventing unintentional actuation of an air control valve. The safety lock includes a disc-shaped base which is securable to an air control valve with the actuating toggle for the control valve projecting therethrough. A locking pawl is pivotally secured to the base for movement between a position at which it blocks movement of the valve control lever between the valve unactuated and the valve actuated positions, and a second location at which it permits the valve lever to be manipulated. A leaf spring is also included as a part of the safety lock for resiliently urging the locking pawl to its position preventing movement of the valve lever to its valve actuating position.

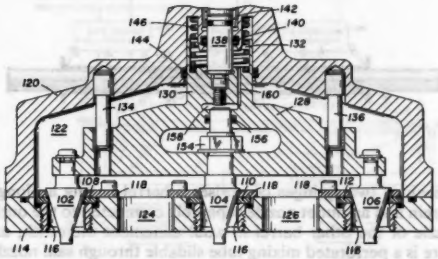
3,700,209
BALANCED PINTLE VALVE

Joe D. Usry, Arlington, Tex., assignor to E-System, Inc., Dallas, Tex.

Filed Dec. 30, 1970, Ser. No. 102,570
Int. Cl. F16k *1/12*
U.S. Cl. 251—282 **11 Claims**

To minimize actuation power requirements in a metering flow control valve, forces generated on the metering pintle are statically and dynamically balanced. To reduce actuation

power, the mechanization of the flow control valve must be an integrated concept that combines valve geometry and balancing techniques. The pintle in either a throttling valve or an injector valve is dynamically balanced by a plurality of passages formed in the pintle. These passages are arranged to be successively withdrawn into the upstream pressure to balance



forces generated by a fluid flowing past the pintle. As each succeeding passage is exposed to the upstream pressure, the pressure in a compensating chamber increases to produce a force that tends to balance the force produced on the pintle by fluid flowing through the valve. With a generally conical shaped metering pintle, the passages are displaced both longitudinally along and radially around the pintle.

3,700,210

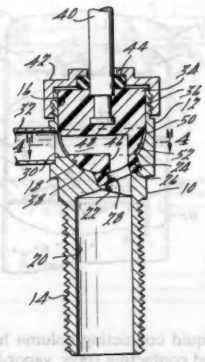
FAUCET VALVE

Alex Manoogian, Grosse Pointe Farms, Mich., assignor to Masco Corporation, Taylor, Mich.

Filed July 27, 1971, Ser. No. 166,542

Int. Cl. F16k *5/22*

U.S. Cl. 251—304 **4 Claims**



A faucet valve in which a rotatable valve member has a spherical valve surface and a passage including an inlet in the spherical surface which is offset from the axis of rotation and rotatable into and out of registry with a similarly offset inlet port in the valve body, and a laterally extending outlet terminating in an annular channel in the spherical surface and communicating with an outlet port in the valve body. The annular channel on the valve surface defines a restricted passage through which water flows when there is only slight registry of the inlet ports in the valve member and valve body to create a back pressure which muffles turbulence and reduces noise.

3,700,211

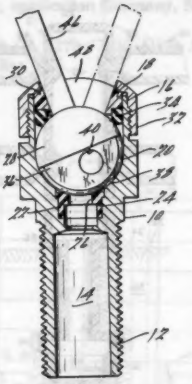
FAUCET VALVE

Alex Manoogian, Grosse Pointe Farms, Mich., assignor to Masco Corporation, Taylor, Mich.

Filed July 27, 1971, Ser. No. 166,543

Int. Cl. F16k *5/22*

U.S. Cl. 251—304 **3 Claims**



A faucet valve in which the valve member comprises a ball rotatable on a horizontal axis within a spherical socket formed in the valve body, the ball having a passage therein having its inlet movable into and out of registry with an inlet port in the valve body and its outlet in constant communication with an outlet port in the valve body.

3,700,212

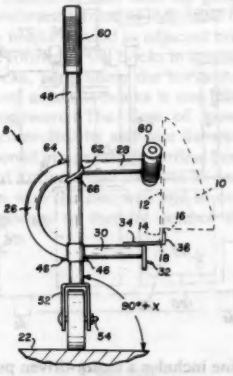
WHEEL DOLLY FOR LIFTING SNOWMOBILES AND THE LIKE

Peter C. Morgenberger, 2366 Spencerport Road, Spencerport, N.Y.

Filed April 8, 1971, Ser. No. 132,297

Int. Cl. B66f *3/00*

U.S. Cl. 254—131 **12 Claims**



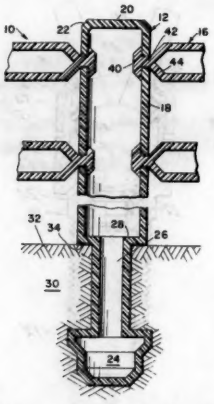
A wheel dolly for lifting an object such as a snowmobile or the like comprising a support bracket for rotatably supporting a lever to which a wheel is secured at one end. The lever is movable between a mounting position in which the bracket may be readily mountable on the object with facility, and a lifting position in which the bracket is releasably secured to the object and the object lifted above a reference or ground surface by the dolly. The lever is vertically adjustable to accommodate the height of the object above the ground surface, and to vary the vertical distance that the object is lifted.

3,700,213

PLASTIC FENCE

Wilfred J. Blease, Greenville, N.H., assignor to Pioneer Plastics, Inc., Greenville, N.H.

Filed Feb. 12, 1971, Ser. No. 114,784
Int. Cl. E04h 17/16
U.S. Cl. 256—19 10 Claims



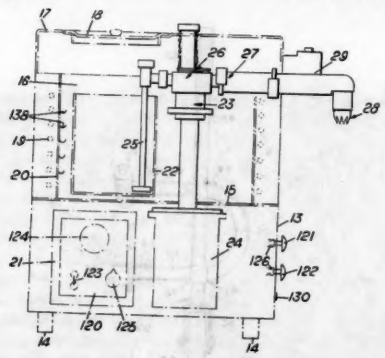
An all plastic fence composed of hollow posts and rails externally textured to simulate wood. The posts are formed with anchor formations at the bottom and vertically spaced holes for reception of snap lock formations at the ends of the rails.

3,700,214

MACHINE FOR PRODUCING AERATED TOPPINGS

John MacManus, 143-16 22nd Road, Whitestone, N.Y.

Division of Ser. No. 883,867, Dec. 10, 1969, Pat. No. 3,606,266. This application June 18, 1971, Ser. No. 154,431
Claims priority, application Great Britain, Dec. 31, 1968, 61,986/68; Feb. 13, 1969, 7,982/69; Sept. 5, 1969, 44,032/69
Int. Cl. B01f 15/02
U.S. Cl. 259—4 7 Claims



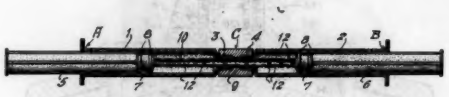
The machine includes a motor-driven pump having an inlet operatively connected both to an air intake and to an unpressurized liquid product container, whereby the liquid product and air are simultaneously drawn into the pump. An adjustable needle valve is provided at the air intake to control flow of air into a chamber which has a check valve at its outlet. The pump outlet is connected to a static, narrow-orifice homogenizer which emulsifies the liquid and air mixture. A solenoid-operated valve is located at the outlet of the homogenizer and an electrical control system simultaneously opens the valve and starts the motor.

3,700,215

MIXING AND DISPENSING DEVICE

Kenneth V. Hardman, Upper Montclair, and Alfred J. Anderson, Livingston, both of N.J., assignors to Hardman Incorporated, Belleville, N.J.

Filed Oct. 21, 1970, Ser. No. 82,753
Int. Cl. B01f 5/12
U.S. Cl. 259—98 2 Claims



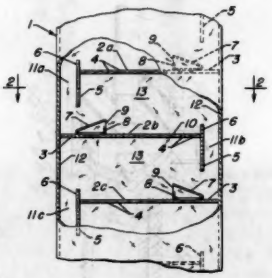
Each of two syringes comprises a barrel having a plunger therein and an outlet nozzle separably connected to the outlet nozzle of the other barrel in axial alinement therewith, and there is a perforated mixing tube slidable through said nozzles with each of its ends in abutting relation to one of said plungers so that fluent substances may be placed in either or both of said barrels, for example, one component of a two part reactive resin system can be placed in each of said barrels, and pumped repeatedly from each barrel into the other barrel through said perforated tube to thoroughly and rapidly mix said substances.

3,700,216

VAPOR-LIQUID CONTACTING DEVICE

Kenneth D. Uitti, Bensenville, and Don B. Carson, Mt. Prospect, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 21, 1970, Ser. No. 99,860
Int. Cl. B01f 3/04
U.S. Cl. 261—114 R 8 Claims



In a vapor-liquid contacting column having a plurality of vertically spaced contacting trays, vapor-liquid contacting on these trays is improved by the installation of:

1. an inwardly slanted imperforate wall adjacent to the imperforate liquid inlet portion of the tray so as to separate the liquid inlet section from the perforate contacting section, and
2. a vertical imperforate wall at a height below the upper edge of the slanted wall.

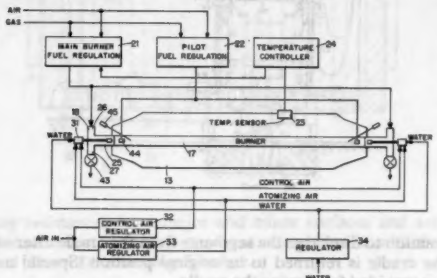
These walls are constructed to form a continuous vapor slot opening across the column which communicates with a lower tray whereby rising vapor is directed against the liquid overflowing the slanted wall to produce a vapor-liquid mixture of uniform composition with a uniform liquid velocity as well as a uniform concentration front.

3,700,217

COOLING SYSTEM FOR HEATED CALENDER ROLLS

Fred W. Rauskolb, Haworth, N.J., assignor to Standard International Corporation, Andover, Mass.

Filed June 14, 1971, Ser. No. 152,634
Int. Cl. F26b *13/18*
U.S. Cl. 263—6 C 6 Claims



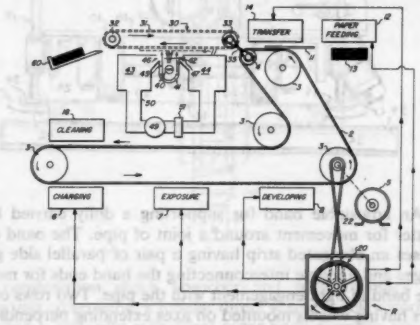
A system for rapidly reducing the temperature of a heated roll used in calender or embossing machines. Water is mixed with and atomized in a stream of air and injected into the burner of the calender roll for impinging on the interior wall of the roll. The water absorbs the heat of the roll and is vaporized and exhausted at either end of the roll in the same manner as are exhaust combustion gases.

3,700,218

ELECTROPHOTOGRAPHIC FUSING APPARATUS

Alexis D. Laisney, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 5, 1971, Ser. No. 112,900
Int. Cl. G03g *13/20, 15/20*
U.S. Cl. 263—6 E 8 Claims



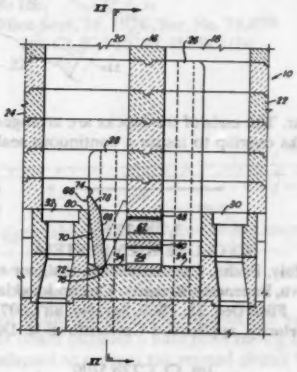
Apparatus for preventing toner and other particulate material from contaminating the fusing station in an electrophotographic apparatus. Means are provided for forming a protective air curtain between the fusing station and the path along which a toner-bearing support travels during the fusing operation, whereby toner and other particulate material separated from the support are intercepted before contacting and thereby contaminating the fusing station. The invention is particularly adapted for use in electrophotographic apparatus of the type in which fusing of the toner image to a receiving sheet is accomplished by passing the receiving sheet with its toner image facing downward overtop a source of thermal energy.

3,700,219

APPARATUS FOR CONTROLLING THE FLOW OF GAS BETWEEN FLUES IN THE HEATING CHAMBERS OF A REGENERATIVE COKE OVEN

Wilhelm Jakobi, Essen, Germany, assignor to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Aug. 28, 1970, Ser. No. 67,888
Claims priority, application Germany, Sept. 19, 1969, P 19 47 389.3
Int. Cl. F27b *17/00;* C10b *5/02*
U.S. Cl. 263—15 R 10 Claims



Regenerative coke oven batteries have heating chambers on opposite sides of the coking chamber and the heating chambers have parallel spaced heating walls with a plurality of spaced flue walls extending transversely between and connected to the heating walls. The flue walls form a series of vertical flues in the heating chambers. Combustion of the gaseous fuels takes place in alternate flues and the gaseous products of combustion are directed to flow downwardly in the adjacent flue for further transfer of heat from the gases to the heating walls. The flue walls are formed of individual bricks in parallel courses with the bricks bonded to adjacent bricks. Cylindrical passageways are formed in the bricks in spaced relation to the edges of the bricks, particularly the horizontal edges so that the bond between adjacent bricks is not interrupted by the horizontal passageways. The flow of gases through the passageways is controlled by slab-like dampener bricks. The bricks are positioned in a generally vertical position parallel to the flue wall and are arranged to pivot in one direction into abutting relation with the flue wall and in overlying relation with the passageways to thereby control the flow of gas therethrough.

3,700,220

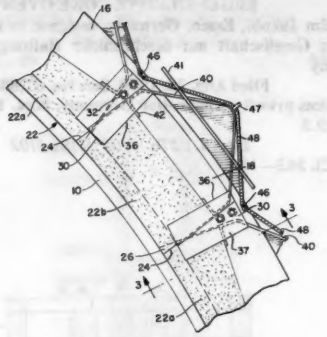
KILN SEAL

Paul Talago, Center Valley, Pa., assignor to Fuller Company

Filed June 18, 1971, Ser. No. 154,577
Int. Cl. F27b *7/24*
U.S. Cl. 263—32 R 9 Claims

A sealing assembly for sealing the opening between a pair of communicating members such as a rotary kiln and the feed end housing or fire hood of the kiln. The seal comprises a plurality of abradable sealing blocks which are in slight engagement with the rotating member or kiln. These sealing blocks

are spring biased toward the kiln and guide means are provided for guiding the blocks radially inwardly toward the kiln



as they wear. The ends of the blocks are arranged so that adjacent blocks overlap to insure a continuous seal around the kiln.

3,700,221

CYCLONE KILN SYSTEM

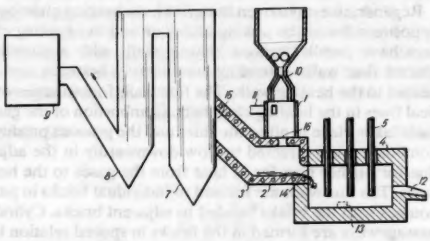
Vladislav Holy, Praha, Czechoslovakia, assignor to Vyzkumny ustav Kovu, Paneneske Brezany, Czechoslovakia

Filed Dec. 23, 1969, Ser. No. 887,607

Claims priority, application Czechoslovakia, Dec. 27, 1968, 880868

Int. Cl. C22b 5/00

U.S. Cl. 266—9 **1 Claim**



A cyclone kiln system for heat treatment of ores and concentrates of non-ferrous metals for separating said metals, provided between the cyclone reactor and the settling oven for slag and stone a distribution chamber with cooled walls, preventing an early decay of the lining of the settling oven.

3,700,222

PIPE SLITTING MACHINE

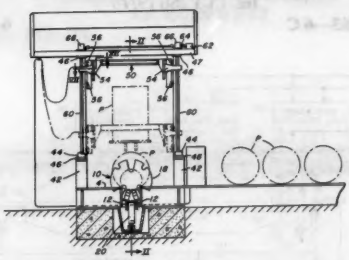
Calvin J. Baxter, Springville, and McKinley B. Thomas, both of Orem, Utah, assignors to United States Steel Corporation

Filed May 13, 1971, Ser. No. 142,871

Int. Cl. B23k 7/04

U.S. Cl. 266—23 K **9 Claims**

Apparatus for cutting a relatively short section of pipe into a plurality of arcuate segments includes a cradle having a support for receiving the pipe with its axis generally horizontal when the cradle is in its lower position and a plate normal to the support at one end of the support. The cradle is pivotally mounted about a horizontal axis and is rotated upwardly through an angle of 90° so that the pipe rests on the plate with its axis vertical. A vertically movable carriage surrounds the pipe when in its upper position and carries a plurality of cutting torches. Means are provided to move the carriage from the bottom of the pipe to the top with the torches in operation to divide the pipe into a plurality of segments. The cradle is then rotated in the same direction as the original



rotation to discharge the segments from the cradle after which the cradle is returned to its original position. Special means are provided for moving the cradle.

3,700,223

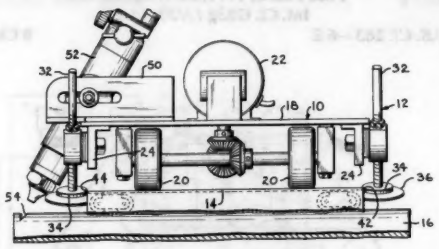
SELF-ALIGNING BAND FOR BEVELING MACHINE

Bernard V. Elliott, Bartlesville, Okla., assignor to H. C. Price Co., Bartlesville, Okla.

Continuation-in-part of Ser. No. 70,355, Sept. 8, 1970, abandoned. This application April 28, 1971, Ser. No. 138,065

Int. Cl. B23k 7/04

U.S. Cl. 266—23 NN **15 Claims**



An adjustable band for supporting a dolly carried bevel cutter for movement around a joint of pipe. The band comprises an elongated strip having a pair of parallel side guide edges and a toggle interconnecting the band ends for moving the band in tight engagement with the pipe. Two rows of rollers having wheels mounted on axes extending perpendicular to the pipe axis are carried by the surface of the band and hold the latter in spaced parallelism with the pipe while permitting movement of the band longitudinally of the pipe.

3,700,224

MELTING FURNACE

Peter Nolting, Toging, Germany, assignor to Vereinigte Aluminium-Werke Aktiengesellschaft, Bonn, Germany

Filed Oct. 13, 1969, Ser. No. 865,856

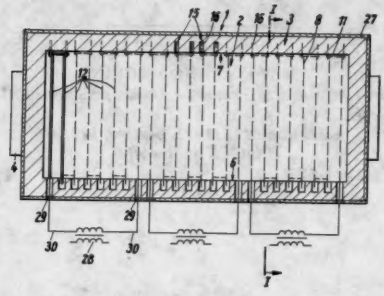
Claims priority, application Germany, Nov. 8, 1968, P 18 07 843.8

Int. Cl. C21b 7/02

U.S. Cl. 266—33 **18 Claims**

A melting furnace comprising a melting chamber in which a plurality of parallel adjacent electric heating resistances are

transversely mounted and secured to opposite wall portions of the chamber in the region of the top thereof. The electric



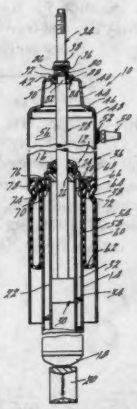
heating resistances have major and minor surfaces and are positioned so that their major surfaces extend parallel with the vertical plane of the melting chamber.

3,700,225

COMBINATION SHOCK ABSORBER AND SUPPLEMENTARY AIR SPRING UNIT AND METHOD OF ASSEMBLING SAME

John H. Fader; Johan H. Keijzer, both of Hasselt, and Marcel Josef Roger Graulus, St. Truiden, all of Belgium, assignors to Monroe Belgium N.V., St. Truiden, Belgium

Filed May 28, 1970, Ser. No. 41,362
Int. Cl. F16f *9/08*; B60g *11/26*; F16f *5/00*
U.S. Cl. 267—35 **12 Claims**



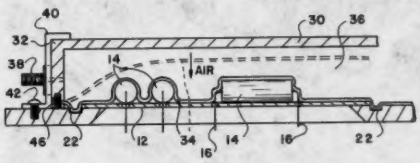
A combination shock absorber and supplementary air spring unit comprising, a tubular direct acting shock absorber including a generally cylindrical outer body member, means adjacent one end of the body member defining a generally annular recessed area, a piston reciprocably disposed within the shock absorber attached to one end of a piston rod extending axially outwardly from one end of the body member, means defining an externally thread end portion on the end of the piston rod extending from the body member, a generally cylindrically-shaped enclosure member arranged coaxially of the shock absorber and spaced radially outwardly from the body member, one end of the enclosure member including means, defining a generally radially inwardly disposed shoulder, a tubular resilient diaphragm member having one end thereof secured to the inner periphery of the enclosure member and the opposite end thereof secured to the body member and defining with the enclosure member a variable volume gas chamber, means adjacent one end of the enclosure member closing one end of the chamber and defining a generally axially disposed opening through which said end portion of the piston rod extends, means threadably received on the end portion of the piston rod for securing the enclosure member thereto whereby reciprocable movement of the piston rod results in concomitant reciprocation of the enclosure member, the relative dimensions of the recessed area, the shoulder and the one end of the diaphragm member being such that relative axial movement between the body member and the enclosure member will result in the shoulder biasing said one end of the diaphragm into peripheral engagement with the recessed area.

3,700,226

PRESSURIZED UNIVERSAL HOLDING DEVICE

Joseph V. Mrugala, Kenmore, N.Y., assignor to Sylvania Electric Products Inc.

Filed Sept. 24, 1970, Ser. No. 75,079
Int. Cl. B23q *3/08*; H05k *3/30*
U.S. Cl. 269—22 **3 Claims**



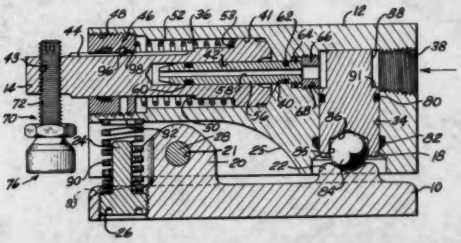
A device for holding components against one surface of a printed circuit board includes a base plate having an opening therein and adapted to support the printed circuit board with the components. A cover has a flexible diaphragm mounted to the periphery of the cover walls to form a closed chamber therewith. The cover with the diaphragm is clamped to the base plate with the diaphragm adjacent to the unsecured components on the printed circuit board. Air, introduced into the closed chamber through a valve in the wall of the cover, deforms the flexible diaphragm about the components forcing them against the printed circuit board.

3,700,227

TRAVERSING WORKHOLDING CLAMP

Donald W. Sessody, Milwaukee, Wis., assignor to Applied Power Industries, Inc., Milwaukee, Wis.

Filed Dec. 9, 1970, Ser. No. 96,537
Int. Cl. B23q *3/08, 3/18*; B25b *1/18*
U.S. Cl. 269—24 **5 Claims**



A traversing workholding clamp, including a base adapted to be mounted on a work surface and a body mounted for pivotal movement on the base between operative and inoperative positions with respect to a workpiece. A traversing clamp arm is mounted for reciprocal motion in the body and includes a clamp assembly at its outer end. A hydraulically actuated piston is mounted in the body for movement toward the base to pivot the body with respect to the base to move the clamp assembly into engagement with the workpiece. Hydraulic fluid

passages are provided in the body to move the traversing arm rapidly to an operative position with respect to the workpiece prior to movement of the piston toward the base to apply pressure to the workpiece.

3,700,228

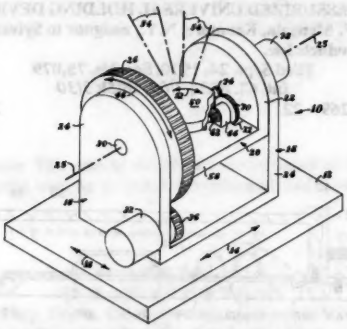
ADJUSTABLE AXIS WORK SUPPORT

Robert E. Peale, 10343 Greentree Drive, Carmel, Ind.

Filed Sept. 25, 1970, Ser. No. 75,378

Int. Cl. B23q *1/18*; B25b *1/22*; B23q *5/54*

U.S. Cl. 269—61 **7 Claims**



An adjustable-axis work support, by which a work object may be selectively positioned with respect to each of two angularly related axes of rotation, and usefully adapted also to an associated movable base to provide an overall assembly having even more than two axes of work-object positioning or adjustment.

3,700,229

EXAMINEE FASTENING DEVICE FOR USE IN AN X-RAY PHOTOGRAPHING APPARATUS

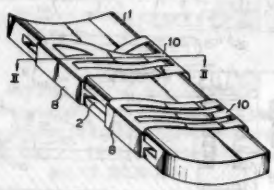
Toshio Kurokawa, Tokyo; Shoji Nishiyama, Machinohe; Katsumi Nagai, Tokyo, and Yuu Mochizuki, Kawasaki, all of Japan, assignors to Toshio Kurokawa, Tokyo; Shoji Nishiyama, Hachinohe-shi, Aomori-ken and Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Sept. 25, 1970, Ser. No. 75,688

Claims priority, application Japan, Sept. 29, 1969, 44/92326; Sept. 29, 1969, 44/92327; Sept. 29, 1969, 44/92328

Int. Cl. A61g *13/00*

U.S. Cl. 269—328 **5 Claims**



An X-ray table top has longitudinal grooves formed in the sides thereof, which grooves have an enlarged engaging recess. Sliding pieces which are respectively received in the grooves and made slidable lengthwise of the table top are movably fitted at one end to the enlarged recesses of the grooves and are connected at the other end to strip-shaped fastening elements of synthetic resin, one of the pair having on its bottom surface a number of generally J-shaped projections and the other having a number of inverted generally U-shaped projections on its upper surface. The fastening elements are overlapped with each other on a patient placed on the table top and pressed together, thereby to permit the projections on the opposing fastening elements to interengage with each other.

3,700,230

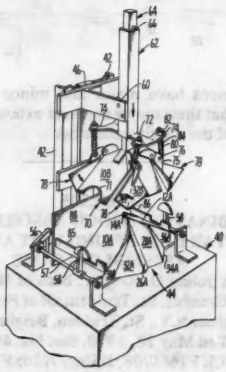
MAP FOLDING MACHINE

Thomas L. Cook, San Francisco, Calif., assignor to Albert S. Giesecke

Filed March 25, 1971, Ser. No. 128,088

Int. Cl. B65h *45/00*

U.S. Cl. 270—61 R **4 Claims**



A semi-automatic machine for folding snap-open maps is provided having a first die for forming center sections and auxiliary dies for forming corner sections.

3,700,231

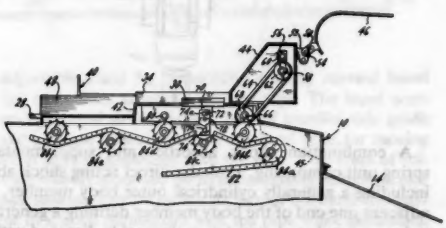
DOCUMENT TURN-AROUND DEVICE FOR COPYING MACHINE

Toruif F. Aasen, Hollywood; Bernard Mogil, Hallendale, and William Sepulveda, Jr., Miami, all of Fla., assignors to Copystatics Manufacturing Corporation, Miami Lakes, Fla.

Filed Sept. 21, 1970, Ser. No. 73,873

Int. Cl. B65h *29/60*

U.S. Cl. 271—64 **6 Claims**

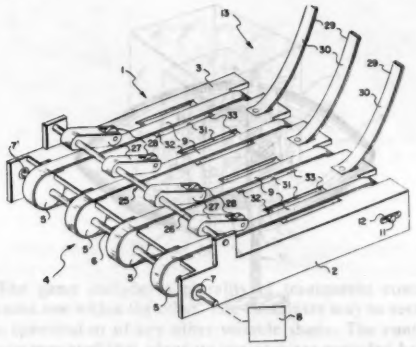


A bridge for placement on top of a copying machine to control the stacking of successive original documents fed through the machine in either of two orders. The attachment includes a baffle which when raised does not intercept the original documents fed through the machine and allows the documents to be stacked in a reverse order in a collecting tray as is the usual practice. However, when the baffle is lowered, it intercepts each original document and guides it so that each document is effectively flipped over. The original documents are collected in a different tray and their order is the reverse of that usually obtained. Transport rollers in the bridge are driven by a belt coupled to a pressure roller in the bridge which engages a drive roller in the machine.

3,700,232
SHEET STACKING APPARATUS

Albert Carl Wiegert, Pittsford, and Edward Balmor Schoonmaker, East Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed March 25, 1971, Ser. No. 127,983
Int. Cl. B65h *29/18, 31/02*
U.S. Cl. 271—75 7 Claims



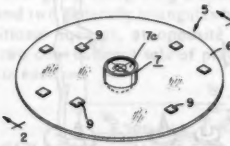
Apparatus for stacking sheet-like articles, wherein a moving belt conveys the articles in generally shingled relation over a platform to a backstop. The backstop is disposed at the rear of the platform for successively guiding such conveyed articles into an orientation stacked substantially on edge across the moving belt. A slot in the platform is disposed forward of the backstop at a location beneath the moving belt for receiving successive portions of the belt should such portions be respectively urged into the slot by the weight of stacked articles. Accordingly, the friction force exerted on a stack of articles by the belt moving in contact therewith will be locally reduced where movement of the belt between the stack and the platform is facilitated by means of the slot.

3,700,233
Patent Not Issued For This Number

3,700,234
BALANCING SKILL GAME

Charles W. Philippi, Bucks Road, Perkasie, Pa.

Filed March 24, 1971, Ser. No. 127,730
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 M 8 Claims

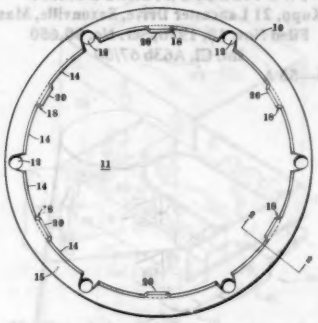


A ferrous disc has a bubble level located at the center of its upper surface and a partially spherical body fastened to the center of its lower surface. At rest on a base, the object is inclined somewhat from a perfect level condition. The players set small magnetic playing-pieces on the upper surface in an attempt to bring the object to an exactly level condition whereupon the bubble is in the exact center of the level. The one whose piece finally brings it to this state is declared the winner of the game.

3,700,235
CIRCULAR BILLIARD TABLE WITH CURVED AND STRAIGHT BUMPER SECTIONS

James D. Meyers, 12132 Sapphire, and John H. Mattson, 12621 Morgan Lane, both of Garden Grove, Calif.

Filed March 27, 1969, Ser. No. 811,075
Int. Cl. A63d *15/06*
U.S. Cl. 273—9 9 Claims

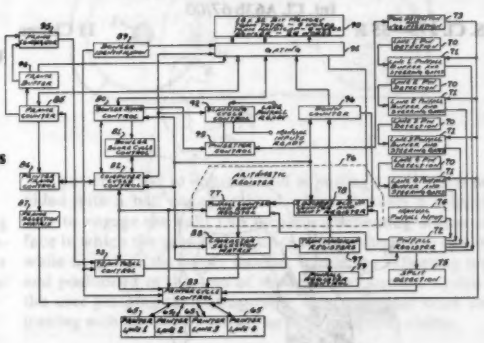


The invention is a circular billiard or pool table having a number of pockets or openings, for receiving billiard balls, which are equally spaced around a circular bumper. Spaced at a mid position between each pocket on the circular bumper is a flat bumper that projects inwards towards the center of the table to prevent billiard balls from traveling a path continuously along the curved bumper to a pocket and also to provide a limited flat bumper surface for rebounding balls.

3,700,236
ELECTRONIC SCORER FOR BOWLING GAMES

Jerome F. Walker, Shaker Heights, Ohio, assignor to Brunswick Corporation

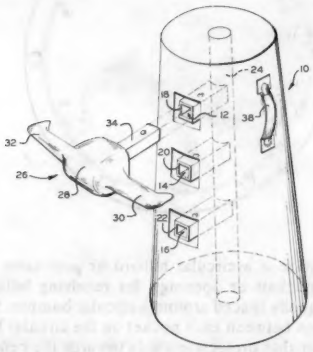
Division of Ser. No. 612,665, Jan. 30, 1967, Pat. No. 3,550,939. This application June 22, 1970, Ser. No. 48,427
Int. Cl. A63d *5/00*
U.S. Cl. 273—54 C 10 Claims



A bowling scoring system having a single computation means for computing scores bowled on any of a plurality of lanes and which (1) includes an error correction system; (2) computes anew at the end of each frame a team total score which will reflect any corrections made to bowlers' scores, includes all pinfall actually earned by bowlers on the team and will be for a discrete team frame whether or not all bowlers on the team are bowling in the same frame; (3) is adapted to be selectively conditioned to score league bowling on all lanes, open bowling on all lanes or league bowling on some lanes and open bowling on other lanes; (4) includes logic which an-

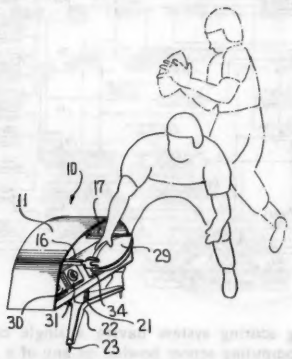
ticipates the nature of a subsequent read-out and conditions a read-out device for the read-out in advance of the operation; (5) incorporates a separate printer for read-out for each lane to be scored; and (6) is formed of a number of electronic registers fabricated primarily of semiconductor components.

3,700,237
TWO-PIECE FOOTBALL DUMMY
Harold W. Kopp, 21 Lancaster Drive, Saxonville, Mass.
Filed Nov. 18, 1970, Ser. No. 90,650
Int. Cl. A63b *67/00*
U.S. Cl. 273—55 A **5 Claims**



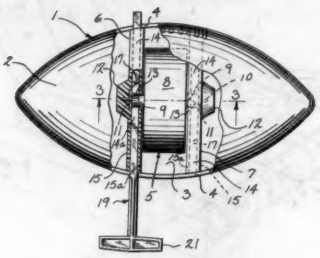
A two-piece football dummy for physical contact training comprising a padded cylindrical, stand-up portion with a second portion attached thereto by vertically adjustable means. The second portion is also generally cylindrical with smaller diameter end portions extending transversely of the stand-up portion to represent the head and shoulders of an opposing player at a predetermined height.

3,700,238
OFFENSIVE TRAINING COORDINATOR
Buddy H. Mathis, 4594 Hawthorne Place, Mobile, Ala.
Filed June 16, 1971, Ser. No. 153,511
Int. Cl. A63b *67/00*
U.S. Cl. 273—55 R **11 Claims**



A machine for developing proficiency of a quarterback and pass receivers in football including a structure resembling the center of a football team and having a pair of arms adjacent the buttocks of the simulated center for supporting a football and having timing devices associated with the arm for sounding audible signals upon removal of the football from the arms by the quarterback preparatory to releasing the ball in response to timed signals.

3,700,239
TOY FOOTBALL
Robert J. Paterick, 6228 West Leroy, Milwaukee, Wis.; Eugenio R. Llana, 1580 North Farwell, Apt. 316, Milwaukee, Wis., and Jerry L. Kleman, 3918 West Orchard, Milwaukee, Wis.
Filed Dec. 30, 1971, Ser. No. 213,859
Int. Cl. A63b *43/00*; A63h *1/04*; A63b *1/32*
U.S. Cl. 273—65 R **5 Claims**



A plastic shell, shaped in the form of a football contains a pair of internal brackets. A gyroscope is rotatably attached to these brackets with its axis of rotation coincident with the axis of rotation of the football. A flexible plastic gear rack engages a pinion gear on the gyroscope, and when pulled through the football, sets the gyroscope in motion. When thrown, the football assumes a nearly perfect spiral rotation during flight.

3,700,240
MISSILE THROWING APPARATUS HAVING CONNECTORS HOLDING TARGETS IN A GIVEN SPACED RELATIONSHIP
Juan J. San Emeterio, Astoria, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Jan. 25, 1971, Ser. No. 109,396
Int. Cl. A63b *71/02*
U.S. Cl. 273—95 R **4 Claims**

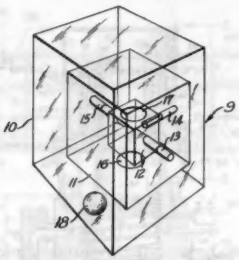
A game employing a plurality of pyramid shaped bases or targets and another plurality of hollow pyramid shaped members or missiles adapted to be thrown from a distance at the targets. A platform is provided for the game player to stand on while projecting the missiles toward the targets. The target areas and the platform are held rigidly in a spaced relationship from one another.

3,700,241

APPARATUS FOR PASSING A BALL THROUGH A SERIES OF CONCENTRIC CONTAINERS

Charles H. Tracy, 53 East Main Street, Earlville, N.Y.

Filed Jan. 3, 1971, Ser. No. 112,114
Int. Cl. A63b *72/04*
U.S. Cl. 273—95 R **2 Claims**



The game includes a plurality of transparent containers located one within the other. The containers may be rectangular, spherical or of any other suitable shape. The containers are so mounted that adequate passages are provided between the inner surfaces of one container and the outer surfaces of an adjacent container. Openings of suitable size are provided in the inner containers at different locations. The game may consist in moving one or more play pieces located within the outer container. The play pieces may be spherical, round, oval or of any other suitable shape. Obviously they must be of a size which will enable them to pass along the passages and through the openings. The game may be varied by providing play pieces of different colors and shapes and by different arrangements of the openings.

3,700,242

CHESS GAME APPARATUS

Bernard Sterler, 51 Kime Ave., North Babylon, L.I., N.Y.

Filed Aug. 5, 1970, Ser. No. 61,326
Int. Cl. A63f *3/02*
U.S. Cl. 273—131 KP **2 Claims**

A zonal chess game comprising a center board containing 64 squares and two generally triangular boards, each containing 20 additional squares, at opposite ends of the center board; and two conventional sets of playing pieces with two extra pawns in each set.

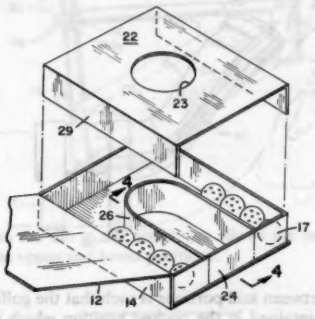
3,700,243

PUTTING CUP ARRANGEMENT FOR GOLF PRACTICE

Jerald R. Kenney, 360 Mountain Avenue, Piedmont, Calif.

Filed April 21, 1971, Ser. No. 136,142
Int. Cl. A63b *57/00*
U.S. Cl. 273—178 R **8 Claims**

A putting cup arrangement in the form of a box structure for putting practice away from a golf course is described. The arrangement simulates a hard-bound book volume and includes a cover portion which is pivotally hinged to the remainder of the structure in the same manner as a book cover is hinged to the remainder of a book. A wall of the structure immediately beneath the hinged cover portion is provided with an aperture which simulates the opening of a golf cup. The cover portion is pivotal on the hinged securance between a closed position lying flat against the wall having the aperture and an open position in which the aperture is revealed and the cover portion acts as a ramp for the passage of a ball to the



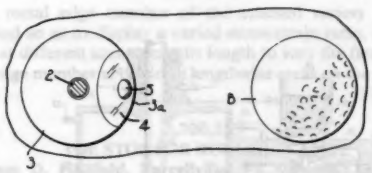
aperture. The floor below the aperture slopes downward to a flap in a side wall which may be opened so that balls may be discharged from the box structure. A partition interiorly of the box structure provides a space for ball storage and defines a raceway extending from a position below the aperture to the sidewall flap opening.

3,700,244

GOLF PUTTER INCLUDING SPHERICAL HEAD WITH MIRROR REFLECTING SURFACE

Alfonso L. Liotta, Box 2066, College Station, Pullman, Wash.

Filed Jan. 21, 1971, Ser. No. 108,336
Int. Cl. A63b *69/36*
U.S. Cl. 273—183 D **1 Claim**



A putter for use to improve skill in putting a golf ball is provided with a ball engaging head which presents a spherical face to engage the ball. This face has a reflecting mirror surface in which the user of the putter can see the image of a ball while he grasps the putter handle. Within the reflecting area, and positioned in the area of the reflecting surface visible to the user grasping the putter, there is an indicator mark contrasting with the mirror surface so as to be readily visible.

3,700,245

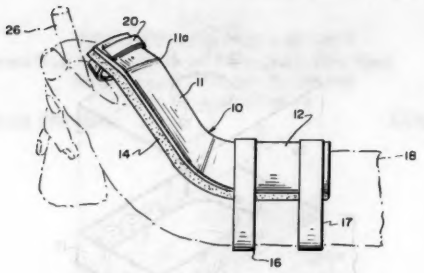
GOLFER'S WRIST ATTACHMENT

Norando Nannini, 316 Euclid, Highwood, Ill.

Continuation of Ser. No. 14,442, Feb. 26, 1970, abandoned.
This application Jan. 3, 1972, Ser. No. 215,124
Int. Cl. A63b *69/36*
U.S. Cl. 273—189 A **2 Claims**

A golfer's wrist attachment to restrain the wrist of the hand which is lower most on a golf club shaft in a cocked position during the entire golf swing. The attachment includes a one-piece semi-rigid member having a first portion which is

secured to the forearm and a second portion which overlies the back of the hand and is secured thereto. The angular rela-



tionship between said portions is such that the golfer's wrist is always maintained in the cocked position which is normally assumed only at the top of the backswing.

3,700,246

A SEALING DEVICE FOR INTRODUCTION OF A VERTICAL ROTARY SHAFT THROUGH AN UPPER WALL OF A CONTAINER OR PIPE

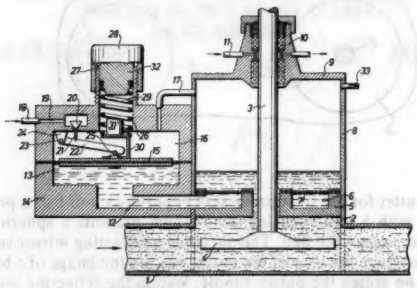
Knut Enarsson, Saffle, Sweden, assignor to Aktiebolaget Kalle-Regulatorer, Saffle, Sweden

Filed Feb. 16, 1971, Ser. No. 115,560

Claims priority, application Sweden, March 25, 1970, 4162/70

Int. Cl. F16j *15/00, 15/40*

U.S. Cl. 277—3 **3 Claims**



A sealing device for introduction of a vertical rotary shaft through an opening in an upper wall of a container or pipe filled with liquid under pressure, the purpose being to prevent the liquid from contact with a packing box supporting the shaft above said wall. A vessel surrounding a shaft portion below the packing box has a bottom opening coinciding with the opening in said upper wall and dimensioned to receive the shaft with clearance. The upper part of the vessel communicates with a source of pressurized gas through a throttle valve, and a diaphragm inserted in the bottom wall of the vessel is adapted to cause the valve to open for supply of gas when liquid from the underlying container rises above a predetermined level in the vessel.

3,700,247

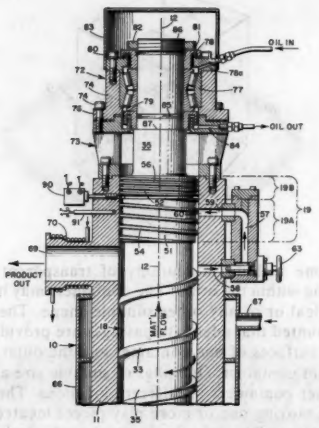
FLUSH COOLING OF SHAFT SEALING SCREW MEANS

Robert G. Butler, Dayton, Ohio; Don E. Carter, Creve Coeur, Mo., and George A. Latinen, deceased, late of Springfield, Mass. (by May V. Latinen, administratrix), assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 16, 1971, Ser. No. 172,106

Int. Cl. F16j *15/40, 15/54*

U.S. Cl. 277—28 **6 Claims**



In certain shaft seals using a viscoseal-type sealing screw such as those adjacent the pressurized screw pump section of a viscous liquid devolatilizer, excessive heat buildup and/or prolonged elevated temperature exposure in the seal region can either deteriorate the liquid materials in the sealing screw or render such liquids less viscous to an extent such that the seal is no longer fully operative. To cool and flush the sealing screw and the liquid materials therein, a fluid conduit bringing fresh liquid material continuously to the sealing screw from the adjacent pressurized section is provided.

3,700,248

SLIDE RING FOR RADIAL AND AXIAL SEALING

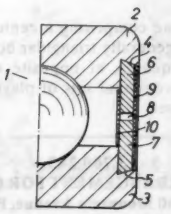
Fritz Teske, Industriestr. 28; Lothar Teske, Industriestr. 30, both of 505 Porz-Westhoven, and Robert Dreismann, Niehler-Kirchweg 139, 5 Cologne-Weidenpesch, all of Germany

Filed Nov. 10, 1969, Ser. No. 875,148

Claims priority, application Germany, Nov. 9, 1968, P 18 08 060.9; Nov. 9, 1968, P 18 08 063.2

Int. Cl. F16c *33/78*

U.S. Cl. 277—80 **20 Claims**



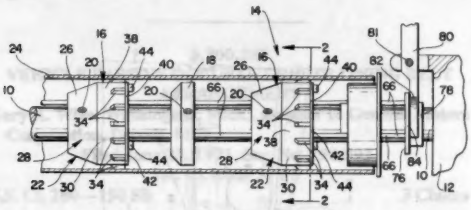
A slide ring seal for radial and axial sealing between a stationary and a rotating machine part, particularly in roller bearings, journal bearings and the like. Independent, strong and thick rings are tightly fastened to each machine part in a common radial plane with respect to one another, while an axial annular gap is maintained between them. The gap is covered by at least one annular plate which is held to the tight-fitting rings by magnetic force.

3,700,249

CHUCK

James N. Allam, Woonsocket, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed Jan. 29, 1971, Ser. No. 111,036
Int. Cl. B23b *31/42*
U.S. Cl. 279—2 **7 Claims**



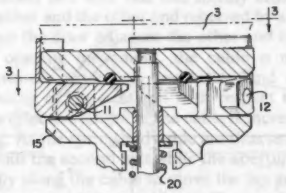
A take-up spindle carries axially spaced chucks each having a body carrying a plurality of chuck members for gripping the inner face of a hollow take-up core. Each chuck has a plurality of concentric springs which urge an actuator into a gripping position to cam the chuck members into gripping engagement with the core. Release mechanism concurrently urges the actuators of all the chucks to a released position whereupon the chuck members of each chuck are urged to a retracted position by an annular spring received in notches in generally radial faces of the respective chuck members. The chuck members are small and light weight to effectively eliminate resultant centrifugal force deforming the core, and are mounted to maintain a normal gripping force on the core although the core may tend to move axially of the spindle and chucks.

3,700,250

GRIPPING TYPE COMPOUND APPLYING CHUCK ASSEMBLY

Fred H. Bautz, Hazel Crest, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Dec. 1, 1970, Ser. No. 94,048
Int. Cl. B23b *31/18*; B25b *1/04*
U.S. Cl. 279—35 **12 Claims**



A chuck assembly for positively gripping a cap, a bottle top or a can end. This chuck assembly is used on a compound applying machine to lift the rotating cap up to the compound applying nozzle and hold the cap by positive mechanical pressure while compound is applied from the nozzle to the inside of the rotating cap.

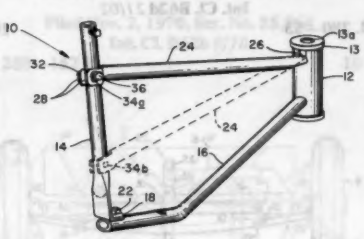
3,700,251

CONVERTIBLE SIDEWALK BIKE

Raymond W. Boucher, Dothan, Ala., assignor to Hedstrom Company, Bedford, Pa.

Filed July 1, 1971, Ser. No. 158,680
Int. Cl. B62k *13/00*
U.S. Cl. 280—7.11 **6 Claims**

A cross-bar hinge for a convertible boy-girl bike employs a T-shaped tab projecting from the forward end of the cross-bar which seats in a notch formed in the upper rear edge of the head tube. A cap engages over the upper end of the head tube



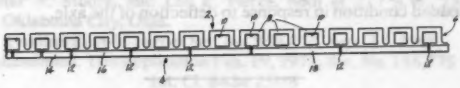
which locks the tab in the notch, yet allows the bar to swing between the upper and lower positions.

3,700,252

METAL EDGE MEMBERS FOR SKIS HAVING VARIED LENGTHWISE STRESS-STRAIN RATIO AND SKIS INCLUDING SUCH MEMBERS

Hermann Schultes, Hohenems/Vlbg., Austria, assignor to Olin Coporation

Filed Jan. 29, 1971, Ser. No. 110,909
Int. Cl. A63c *5/04*
U.S. Cl. 280—11.13 N **12 Claims**



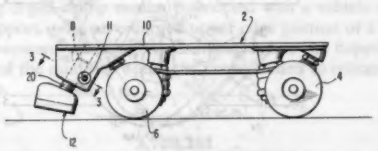
A metal edge member of the cracked variety which is formed so as to display a varied stress-strain ratio, or spring rate at different areas along its length to vary the flexibility of the edge member at different lengthwise areas on the ski.

3,700,253

TOE STOP FOR ROLLER SKATES

Vernon D. Heitfield, Purcellville, Va., assignor to William Buffington, Jacksonville, Fla.

Filed Sept. 7, 1971, Ser. No. 178,312
Int. Cl. A63c *17/14*
U.S. Cl. 280—11.2 **5 Claims**

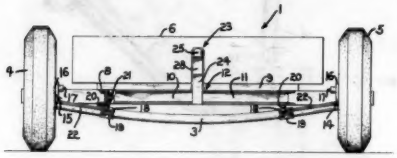


A toe stop has a flat floor-engaging surface disposed at such an angle to a mounting stud that it engages flat against the floor when the skate is tipped forwardly. The portion having the floor-engaging surface is molded of relatively soft plastic having a high coefficient of friction, and the portion in which the mounting stud is embedded is formed of relatively hard plastic with a lower coefficient of friction.

3,700,254
TRAILER

Leonard F. Eck, 418 North Hartup, McPherson, Kans.

Filed July 6, 1971, Ser. No. 160,003
Int. Cl. B62d 21/02
U.S. Cl. 280—63 10 Claims

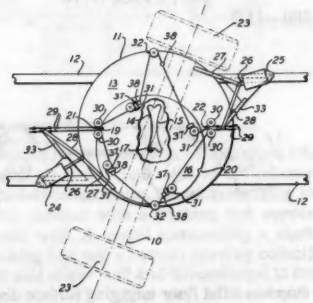


A trailer having an axle adapted to absorb shock includes a load supporting frame and a forwardly extending portion having an adjustable leveling hitch mounted thereon and having a movable portion selectively raised and lowered and connected to a towing vehicle to maintain the frame substantially level. The trailer includes a pair of wheels rotatably mounted on spindles at opposite ends of an axle formed of spring metal. Spaced connection members are mounted on the axle in upstanding relation with portions fixed to the frame and the connection members permit deflection of the axle relative to the frame as determined by the load on the trailer. The axle has a spindle at opposite ends and inclined downwardly to position the wheels closer together at the bottom than at the top when the frame is in an unloaded condition and substantially upright or slightly closer together at the top when the frame is in a loaded condition in response to deflection of the axle.

3,700,255
PIVOTABLE AXLE

Daniel H. Herbert, 138 Ainsworth Ave., East Brunswick, N.J.

Filed June 18, 1971, Ser. No. 154,353
Int. Cl. B62d 53/06
U.S. Cl. 280—81 A 3 Claims

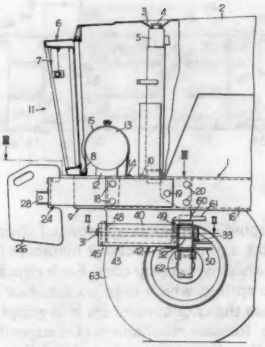


A trailer or truck axle which prevents scuff-wear of tires by yielding to a normal course with respect to the direction of travel by being anchorable at two different pivot points.

3,700,256
FRONT END SUSPENSION

Elborn W. Jones, Jr., State College, Miss., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 13, 1970, Ser. No. 80,286
Int. Cl. B62d 25/08, 37/04
U.S. Cl. 280—87 R 10 Claims

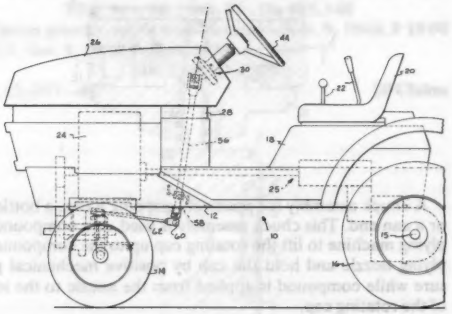


A front end suspension system having the radius rods extending forwardly from the front axle to support a pivot pin journaled in a massive support member supporting the front end of the vehicle and maintaining stability and steering control.

3,700,257
TILTABLE STEERING SYSTEM

Joseph C. Hurlburt, Leola, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed March 30, 1971, Ser. No. 129,433
Int. Cl. B62d 1/18
U.S. Cl. 280—87 A 7 Claims



A steering system for a vehicle including a tiltable steering shaft connected to a driven lever arm by a universal coupling, the driven lever arm being operatively connected to the vehicle's front wheels for transmitting motion thereto. The steering shaft is rotatively journalled within a steering yoke which is pivotally secured about an axis extending transversely of the vehicle and moveable back and forth thereabouts relative to an operator's station spaced rearwardly therefrom.

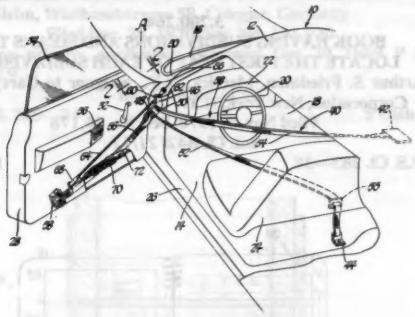
Housed generally within the steering yoke and operatively associated with the steering shaft is an orbital gear reduction arrangement which effectuates a reduction in the steering system before the output steering motion is transmitted through the universal coupling, thereby tending to minimize load pulsations and variations in steering response when the steering shaft and lever arm are disposed in substantial non-aligned orientations.

3,700,258

VEHICLE PASSIVE OCCUPANT RESTRAINING BELT ARRANGEMENT

Gary A. Wize, Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 25, 1971, Ser. No. 156,892
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 SB **3 Claims**



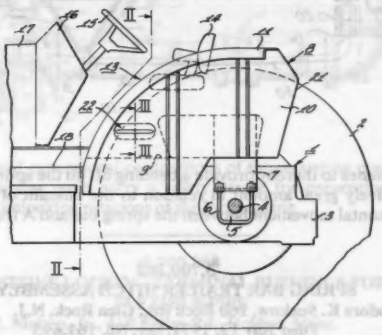
A vehicle passive occupant restraining belt arrangement includes a generally flexible cable with one end attached to the vehicle body generally adjacent the lower end of a windshield pillar laterally of the hinge axis of the adjacent door, a door mounted guide receiving the other end of the cable which extends to within the door for attachment to one end of a helical spring whose other end is fixed to the door, an apertured member slidably receiving an intermediate portion of the cable and connected to lap and shoulder belt portions of a first belt, and a second belt with one end fixedly attached to the apertured member and the other end received by a belt retractor mounted on the door adjacent the other end of the cable. During door opening movement, the cable is moved to a generally outwardly extending orientation and due to the lateral positioning of the one end with respect to the door hinge axis, the effective length of the cable is increased to tension the spring. As the spring and cable are thus tensioned, the retractor extends the second belt while the apertured member slides forwardly along the cable to move the lap and shoulder belt portions to easy-enter positions. During door closing movement, the retractor retracts the second belt and the apertured member slides rearwardly along the cable to move the lap and shoulder belt portions to occupant restraining positions while the cable slackens and moves to a generally longitudinally extending orientation adjacent the lower door edge and generally out of sight. In another embodiment, the one end of the cable slides through a guide mounted on the vehicle body adjacent the lower end of the windshield pillar and is attached to the forward edge of the door laterally of the hinge axis. In this embodiment, the effective change in length of the cable during door movement is increased by the corresponding change in distance between the guide and the end of the cable attached to the forward door edge. When the door is moved to closed position, a resilient member pulls the cable back through the guide and the cable assumes a slackened condition adjacent the vehicle body floor and generally out of sight.

3,700,259

FENDER LOUVER

Robert J. Scheinkoenig, Franklin, and Robert C. Haupt, Milwaukee, both of Wis., assignors to Allis-Chalmers Corporation

Filed Nov. 2, 1970, Ser. No. 85,864
Int. Cl. B62b *9/16*
U.S. Cl. 280—152 R **10 Claims**



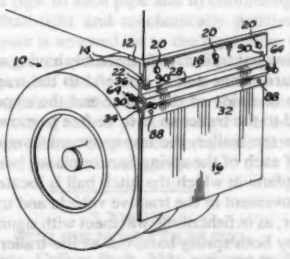
A fender louver on the rear wheel fender of a tractor to provide visual means of determining the condition of wheel rotation.

3,700,260

MUD FLAP AND MOUNTING MEANS

Peter N. Moore, and Leo F. Pierce, both of 117 S.W. 23, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 858,078, Sept. 15, 1969, abandoned. This application Feb. 19, 1971, Ser. No. 116,775
Int. Cl. B62d *25/18*
U.S. Cl. 280—154.5 R **6 Claims**



Spring urged clamp means, connected with a vehicle rearward support, grips an enlarged upper edge portion of a mud flap. Downwardly directed stress impressed on the depending portion of the mud flap opens the clamp means to release the mud flap.

3,700,261

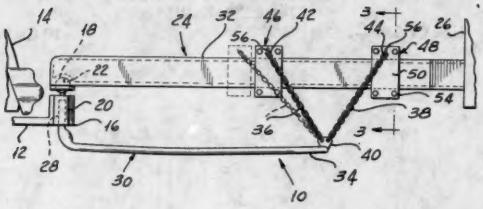
SPRING BAR ASSEMBLY FOR TRAILER HITCHES

Theodore K. Suckow, 160 Rock Road, Glen Rock, N.J.

Filed April 12, 1971, Ser. No. 133,239
Int. Cl. B60d *1/06*
U.S. Cl. 280—406 A **16 Claims**

The spring bar assembly for trailer hitches provides for each articulating spring bar, located adjacent opposite sides of a trailer A frame, dual suspension members interconnecting the free end portion of the spring bar with the A frame in such a

manner that the opposite ends of each of the suspension members are connected at points lying in spaced, imaginary, vertical planes to thereby provide a bending lift on the spring bar of relatively great amount in relation to the amount of relative horizontal movement between the spring bar and A frame.



3,700,262

SPRING BAR TRAILER HITCH ASSEMBLY

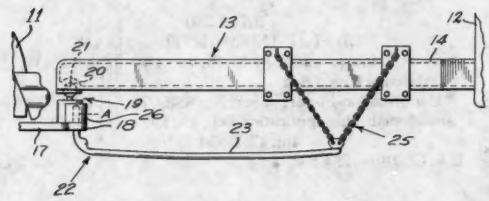
Theodore K. Suckow, 160 Rock Rd., Glen Rock, N.J.

Filed July 12, 1971, Ser. No. 161,693

Int. Cl. B60d *1/06*

U.S. Cl. 280—406 A **8 Claims**

In a spring bar trailer hitch assembly having spring bars each of which are connected at one end to the tractive vehicle to extend on one side of the trailer and the opposite distal end connected to the trailer so as to be free to move longitudinally relative to the trailer, the improvement comprising the connection of each of the spring bars in planes horizontally offset from the plane in which the hitch ball is located so that upon pivotal movement of the tractive vehicle and trailer relative to each other, as in fishtailing, will meet with significant initial resistance by both spring bars, but as the trailer moves further from the centerline of the tow car as in rounding a curve, the longitudinal movement of one of the spring bars relative to the trailer will be greater than such movement of the other spring bar thereby effecting a greater force on the side of the trailer on the outside of the curve than the force exerted on the side of the trailer located on the inside of the turn.



3,700,263

HITCH

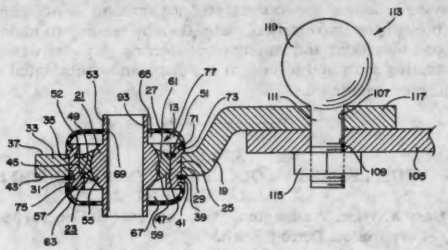
Leon E. Day, Memphis, Tenn., assignor to Richard Routon and James B. Sellers, Memphis, Tenn., part interest to each

Filed April 27, 1971, Ser. No. 137,762

Int. Cl. B60d *1/06*

U.S. Cl. 280—415 A **5 Claims**

A hitch for hitching a towed device, such as a trailer, to a towing vehicle such as a pick-up truck, automobile, tractor or the like. The hitch includes a swivel assembly, a ball and pin assembly removably held in the swivel assembly and adapted to be engaged by a socket mounted on a trailer tongue, and a holder retaining a movable portion of the swivel assembly in a fixed position. The ball and pin assembly and the holder are removable to convert the hitch so that it is usable with a tongue having a pin type of arrangement.



3,700,264

BOOK HAVING SUBDIVISIONS AND MEANS TO LOCATE THE FIRST LEAF OF EACH SUBDIVISION

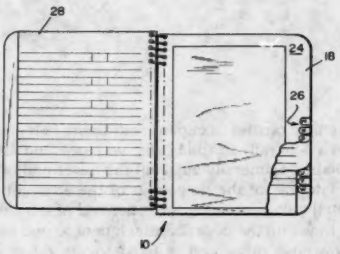
Arthur S. Friedman, Merrick, N.Y., assignor to Carey Press Corporation, New York, N.Y.

Filed Nov. 2, 1970, Ser. No. 86,178

Int. Cl. B42f *21/12*

U.S. Cl. 283—38 **1 Claim**

A book having a plurality of subdivisions which consist of a varying number of leaves. Reference leaves are located at the front and back of the book and flank the subdivisions. All the leaves are the same width except those which precede the first leaf of a subdivision, these are narrower. As a result of the above construction a person can thumb through the book and as he does so there will be a slight pause in the passage (flexing) of leaves past his thumb as each narrower leaf slips beneath his thumb and momentarily rests on the first leaf of the following subdivision for the period of the pause. This enables a user to more rapidly locate and stop at the first page of any desired subdivision.



3,700,265

INTERNAL PIPE SEALING DEVICE

Raymond J. Dufour, Wheaton, Ill., and James J. Grimm, Columbus, Ohio, assignors to Northern Illinois Gas Company, Aurora, Ill.

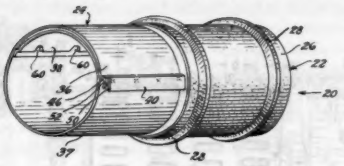
Division of Ser. No. 35,140, May 6, 1970. This application Feb. 4, 1972, Ser. No. 223,596

Int. Cl. F16l *55/00*

U.S. Cl. 285—15 **7 Claims**

The sealing device is composed of an inner expandable retainer member and an outer elastic sealing member. The inner retainer member in the unexpanded position has a cylindrical sleeve configuration with its end portions in an overlapping arrangement. One of these end portions has two locking grooves to accommodate a range of pipe diameters,

which are adapted to receive and hold the other end. The outer elastic member has two annular spaced ridges formed of



a deformable hard material which are urged against the pipe's interior by the inner retainer member to form an air-tight seal with the pipe.

3,700,266

DEVICES FOR CONNECTING PIPES TOGETHER

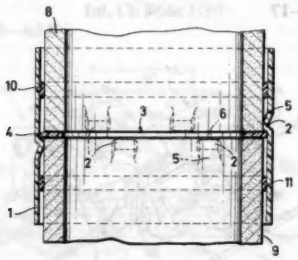
Karl Glehn, Wiethasetstrasse 58, Cologne, Germany

Filed Dec. 28, 1970, Ser. No. 101,920

Claims priority, application Germany, Dec. 30, 1969, P 19 65 600.9

Int. Cl. F16l *21/02*

U.S. Cl. 285—24 **5 Claims**



A device for interconnecting pipes and consisting of a yieldable plastics sleeve having two rows of axially offset lugs formed on its inner surface which serve to centralize and support the pipes. The rows of lugs have a gap therebetween accommodating a resilient or flexible plain annular disc. The disc separates the ends of the pipes and contacts stop faces of the lugs extending perpendicularly to the longitudinal axis of the sleeve.

These lugs also have inclined bearing faces adjoining the stop faces and engaging the pipes and the disc can slide over these faces when being installed in the gap. Sealing rings are disposed between the exterior of the pipes and the interior of the sleeve.

3,700,267

PIVOTAL QUICK DISCONNECT FLUID FLOW COUPLING

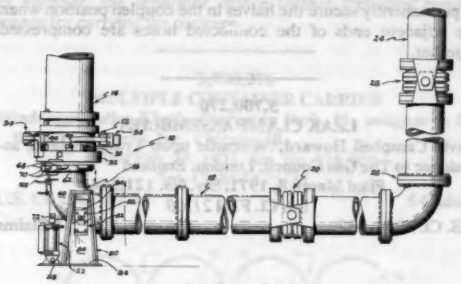
Henry John Piegza, Clarence, N.Y., assignor to Welding and Steel Fabrication Co. Inc., Tonawanda, N.Y.

Filed Nov. 4, 1971, Ser. No. 195,653

Int. Cl. F16l *19/00*

U.S. Cl. 285—24 **5 Claims**

An upwardly opening, generally L-shaped movable coupling part is mounted for vertical pivoting movement at one end of an elongated horizontally extending fluid conduit under the control of a fluid cylinder, and a rotary locking ring is supported on a downwardly opening, relatively stationary coupling part and operable to releasably lock open ends of the coupling parts together in vertical alignment. Guide devices serve to constrain the movable coupling part for vertical swinging movement; such devices being effective in preventing horizontal displacement of the movable coupling part due



to thermal expansions/ contractions of the mounting conduit. The coupling parts carry a safety device for preventing undesired unlocking rotations of the locking ring.

3,700,268

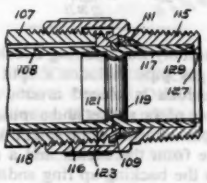
POSITIVE LOCKING TERMINAL BUSHINGS FOR FLEXIBLE PIPE

Anker J. Nielsen, Jr., 410 Bailey Rd., Holden, Mass.

Division of Ser. No. 522,877, Jan. 25, 1966, abandoned. This application July 2, 1969, Ser. No. 847,775

Int. Cl. F16l *9/14*

U.S. Cl. 285—55 **3 Claims**



This device is an adapter for joining flexible tubing run through a rigid pipe to such pipe and to continuing rigid piping, in both fluid-tight and mechanically positive relation. When the adapter is screwed on to the rigid pipe, the end of the pipe presses a non-metalic gasket into sealing relation with the protruding end of the flexible tubing and the adapter and forces a deformable metallic ring to contract about the tubing and crimp the tubing into a preformed groove in a metallic sleeve within the tubing. Stop means keeps the parts from exerting destructive pressure on the gasket.

3,700,269

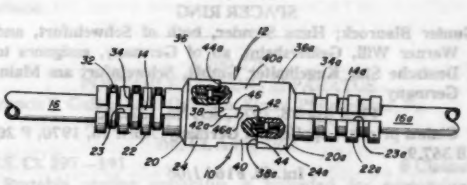
SEXLESS HOSE COUPLING

Eugene A. Salata, College Park, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 17, 1970, Ser. No. 90,243

Int. Cl. F16l *13/00*

U.S. Cl. 285—78 **4 Claims**



A coupling for interconnecting lengths of flexible hose having identical half members including cooperating complimen-

tary surfaces which upon abutting the halves together and twisting them in opposite directions cam the halves together into a tight fitting connection. Spring biased detent pins serve to permanently secure the halves in the coupled position when the adjacent ends of the connected hoses are compressed together.

3,700,270

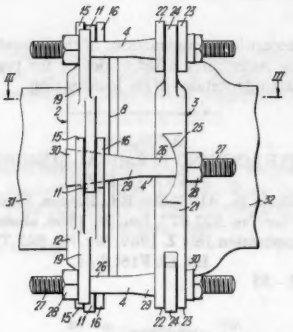
LEAK CLAMP ASSEMBLIES

David Campbell Howard, Newcastle upon Tyne, England, assignor to The Gas Council, London, England

Filed March 8, 1971, Ser. No. 121,944

Int. Cl. F16l *21/00*

U.S. Cl. 285—337 **4 Claims**



A leak clamp assembly for repairing a leak in a spigot and socket joint in a gas pipe includes a split sealing ring of resilient material which is placed around the spigot and against the outer face of the socket and a split rigid backing-up ring which is also placed around the spigot on the side of the sealing ring remote from the socket and a series of clamps which act between the backing-up ring and the back face of the socket. The backing-up ring comprises at least two arcuate sections containing a bolt hole at each end, the sections being connected end to end to form the ring and overlapping at their junctions so that the corresponding holes are at least partly in register with each other. The clamps comprise bolts for passing through the pairs of overlapping holes and designed to engage behind the socket preferably with an anchor ring which is assembled around the pipe behind the socket. The bolts comprise a conventional shank for cooperation with a nut and a head which tapers to the shank, the arrangement being such that the backing-up ring section can be arranged with the bolt holes overlapping to a minimum degree around the shanks of the bolts to provide the backing-up ring with a maximum size, but on tightening the nuts on the bolts, the tapered heads are drawn into the overlapping holes thus increasing the extent of the overlap and drawing the backing-up ring sections further together until the backing-up ring tightly engages the sealing ring and clamps it around the spigot and against the face of the socket of the spigot and socket joint.

3,700,271

SPACER RING

Gunter Blaurock; Hans Stender, both of Schweinfurt, and Werner Will, Geldersheim, all of Germany, assignors to Deutsche Star Kugelhalter GmbH, Schweinfurt am Main, Germany

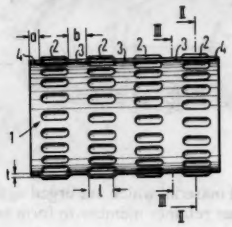
Filed April 8, 1971, Ser. No. 132,503

Claims priority, application Germany, April 16, 1970, P 20 18 367.9

Int. Cl. F16d *1/06*

U.S. Cl. 287—52.04 **10 Claims**

A tubular spacer ring for frictionally fastening a shaft in the oversized bore of a machine element is bent from a strip of embossed sheet metal having several circumferential rows of axially elongated projections on one face and corresponding recesses in the other face. The projections have a preferred axial length of 5–8 times their radial height, and must have a



length of 3–10 times the height. The projections are identical and uniformly distributed in each row, but the rows are circumferentially offset by a fraction of the center-to-center spacing of the projections in each row.

3,700,272

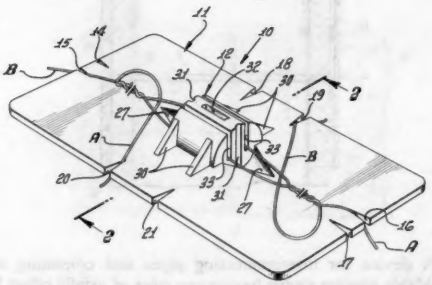
FISHERMAN'S KNOT TYING DEVICE

George J. Bauer, 3498 Duffy Street, San Bernardino, Calif.

Filed April 8, 1971, Ser. No. 132,318

Int. Cl. D03j *3/00*

U.S. Cl. 289—17 **6 Claims**



A hard plastic cylinder ⅝ inch in diameter and ¾ inch long is freely rotatably mounted in a semi-cylindrical recess provided centrally in the upper surface of a 2 × 4 × 1/16 inch rigid sheet plastic carriage. Line anchoring notches are provided in the carriage ends and sides and a loop receiving slot is formed axially in the recess bottom with circumferential loop anchoring recesses at its ends.

The cylinder has two line twisting slots extending lengthwise thereof, and a central diametral loop receiving hole capable of alignment with said loop receiving slot in the carriage. Diametral line guide grooves are provided in the cylinder ends. The carriage recess has central conical free spaces at its ends whereby lines being tied into a knot may be rotated with the cylinder in order to twist two strands of a line together.

3,700,273

ENERGY ABSORBING BUMPER SYSTEM

George W. Jackson; Paul J. Long, Jr., and Wayne V. Fannin, all of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

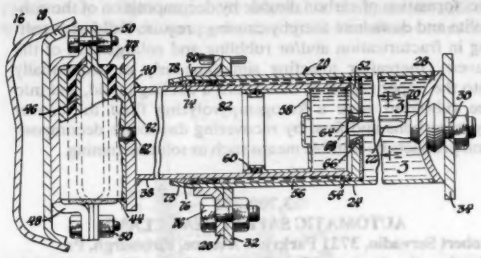
Filed Nov. 19, 1970, Ser. No. 91,008

Int. Cl. B60r *19/02*; F16f *9/06*

U.S. Cl. 293—70 **5 Claims**

An energy absorbing bumper system for automotive vehicles includes a pair of fluid-filled telescopic cylinder units at respective ends of the bumper mounting the same to the vehi-

cle chassis. Variable volume fluid chambers within each unit have the fluid flow therebetween controlled by a floating orifice and metering rod and one of the chambers is bounded by a gas piston urged by a body of compressed gas to force the



telescopic mounting unit to a definite extended or normal position wherein the cylinders of the unit are snugly interengaged to resist relative radial displacement in rough road conditions and the like.

3,700,274

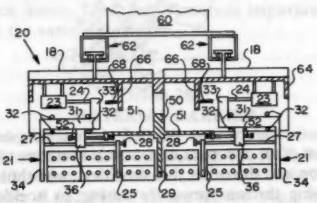
APPARATUS FOR STACKING UNCURED BRICK

Forrest A. Paschal; Gerald L. Stuart, and Forrest A. Paschal, II, all of Silver City, N.C., assignors to Forrest Paschal Machinery Company, Silver City, N.C.

Filed March 4, 1971, Ser. No. 121,058

Int. Cl. B66c *1/30*

U.S. Cl. 294—63 R **6 Claims**



In a pickup head for gripping one or more columns of raw, uncured brick or tile arranged in end-to-end relationship, at least one support tongue disposed between a pair of outer gripper arms for reciprocal sliding movement longitudinally of the column. The slidable support tongue supports the brick intermediate the gripper arms and prevents deformation of the soft brick ends.

3,700,275

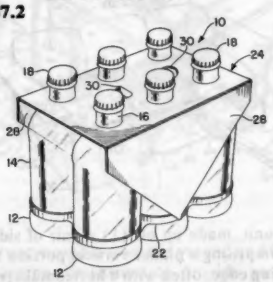
CONTAINER PACKAGE

Raymond E. Deasy, Mt. Prospect, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed May 20, 1970, Ser. No. 39,670

Int. Cl. B65d *71/00*

U.S. Cl. 294—87.2 **1 Claim**



A container package for a plurality of bottles or the like including a carrier device which holds and retains the bottles in spaced positions adjacent the lower ends thereof, and a separator device which is positioned adjacent the tops of the bottles and is attached to the carrier device to provide a unitary package, the separator device further including handle means for carrying the package.

3,700,276

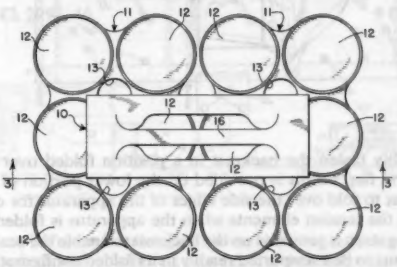
MULTIPLE CONTAINER CARRIER

Mindaugas Julius Klygis, Evergreen Park, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Filed Feb. 23, 1971, Ser. No. 118,000

Int. Cl. B65d *25/28*

U.S. Cl. 294—87.2 **5 Claims**



A carrier device for use with multiple container carriers for retaining and transporting a plurality of multiple container carriers.

3,700,277

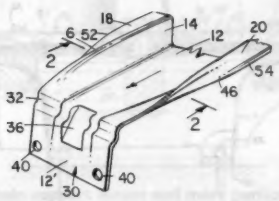
ROOF BOW DEVICE

John Montean, Jr., North Olmsted, Ohio, assignor to The Ohio Moulding Corporation, Wickliffe, Ohio

Filed May 3, 1971, Ser. No. 139,774

Int. Cl. B62d *25/06*

U.S. Cl. 296—104 **10 Claims**



A roof bow device for use with a vehicle including a channel-like body member made from a single piece of sheet material adapted at its opposed ends for attachment to a vehicle. The body member includes a pair of oppositely disposed side walls interconnected together by a web portion with flanges extending laterally outwardly from the side walls adjacent the end remote from the web portion. The flanges each include flute-like deformations adjacent the opposed ends of the body member to provide optimum securement with the vehicle.

3,700,278

PORTABLE SEATING APPARATUS

Francis S. Gulba, 1405 Oakmont Street, Philadelphia, Pa.

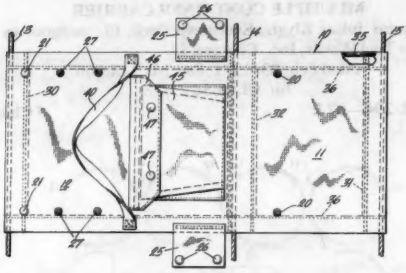
Filed Jan. 12, 1971, Ser. No. 105,796

Int. Cl. A47g *7/62*

U.S. Cl. 297—191 **8 Claims**

Portable seating apparatus is provided for suspension between spaced apart uprights such as trees. The seating apparatus is of flexible material and has a seat portion and a

backrest portion which are suspended from the uprights by means of tension elements extending outwardly from the upper margin of the backrest and from the bottom of the seat to engage around the uprights. The backrest tension element is secured around the uprights at a location above the place of attachment of the seat tension elements to dispose the backrest in an upright position in use. Means is provided to



releasably fasten the backrest in a position folded over the seat, and flap means is provided on the lower portion of the backrest to fold over the side edges of the apparatus for containing the tension elements when the apparatus is folded. A carrying strap is provided on the backrest to enable the seating apparatus to be transported readily in its folded configuration; and pouch means is provided on the reverse side of the backrest for storing articles.

3,700,279

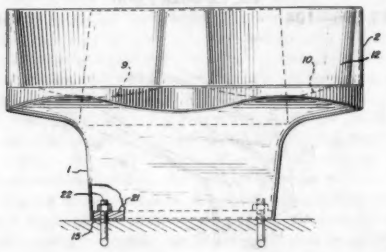
TWO PLACE SEATING UNIT

Richard G. Reineman, Balboa, Calif., and George E. Schaefer, Muskegon, Mich., assignors to Brunswick Corporation

Filed Oct. 2, 1970, Ser. No. 77,568

Int. Cl. A47c *5/12*

U.S. Cl. 297—232 **7 Claims**



The invention is of a two place seating unit of molded fiberglass. The assembled unit is a unitary structure having a sculptured appearance, which permits the user to sit comfortably whether facing immediately forward of the seating unit or to either side. Cantalever mounting is employed to afford maximum free space beneath the seating consistent with its sculptured appearance.

3,700,280

METHOD OF PRODUCING OIL FROM AN OIL SHALE FORMATION CONTAINING NAHCOLITE AND DAWSONITE

Michael N. Papadopoulos, Lafayette, Calif., and Russell C. Ueber, Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Continuation-in-part of Ser. No. 835,323, June 23, 1969, abandoned. This application April 28, 1971, Ser. No. 138,379

Int. Cl. E21b *43/24, 43/28*

U.S. Cl. 299—5 **5 Claims**

A new and improved method of recovering hydrocarbons and dawsonite decomposition products from a subterranean oil shale formation containing substantial amounts of nahcolite and dawsonite comprising penetrating said formation with at least one well borehole and forming a cavern therein. A hot fluid is circulated in the upper region of the cavern to effect formation of carbon dioxide by decomposition of the nahcolite and dawsonite thereby causing pressure build-up resulting in fracturization and/or rubbling and enlargement of the cavern, thereafter injecting simultaneously or sequentially into the upper region of the cavern a cooling liquid, and into the rubblized zone a kerogen-pyrolyzing fluid to recover hydrocarbons and final by recovering dawsonite decomposition products by suitable means such as solution mining.

3,700,281

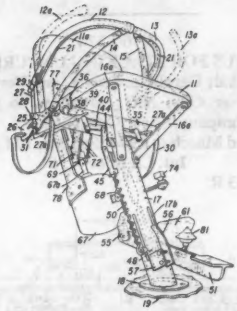
AUTOMATIC SAFETY SEAT CLAMP

Robert Servadio, 3721 Parkview Avenue, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 804,423, March 5, 1969. This application March 8, 1971, Ser. No. 121,804

Int. Cl. A62b *35/60*

U.S. Cl. 297—390 **8 Claims**



An automatic safety seat pair of clamps adapted to be moved in front of an occupant of a vehicle seat, one to restrain his mid section and the other, his shoulders, and thus prevent him from being thrown forwardly during an accident. The mid-section safety clamp is automatically raised from a low retracted position and the shoulder clamp is moved inwardly in front of the shoulders in response to the occupant's body pressure which actuates a switch on the seat back. The mid-section clamp completely encircles the occupant in response to foot pedal action. The clamps are retracted by motor power.

3,700,282

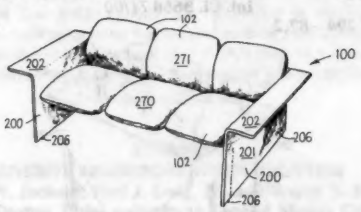
SEATING UNIT

David L. Rowland, 49 West 55th Street, New York, N.Y.

Filed Dec. 30, 1969, Ser. No. 889,155

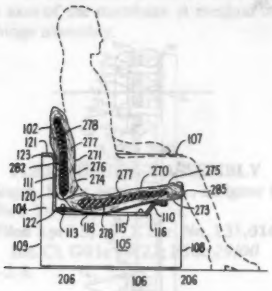
Int. Cl. A47c *4/02, 7/54*

U.S. Cl. 297—440 **44 Claims**



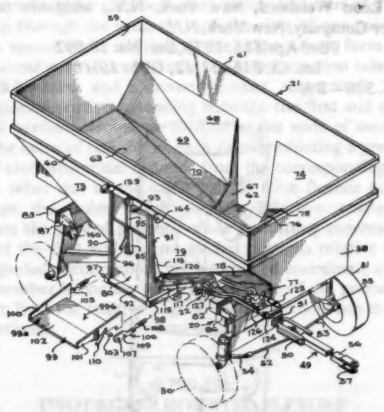
A seating unit, made up of: (1) a pair of side panel members, each comprising a planar vertical portion having a lower unit-supporting edge, often with a horizontal arm portion at its upper end, (2) a generally horizontal seat frame member, (3) a generally vertical back frame member having a generally vertical panel portion, often with a horizontal portion at its

upper end, (4) releasable clamp or threaded means or other locking means securing each side panel member to the seat frame, (5) hinges securing the seat frame and back frame together, so that they can be folded together or erected at approximately a right angle, (6) releasable clamp or threaded means or other locking means securing the back frame to each



side panel, and (7) at least one cushion with seat and back portions resting on the seat frame and back frame, the seat and back frames each being a single cushion wide or a width equal to an integral number of cushions. The unit may also have removable upholstery; this may comprise a casing of stretchable upholstery fabric with padding at least five times as thick as the fabric adhered to the fabric; a suitable undersize casing is secured releasably around each side panel and held in tension thereon, and a similar casing is held in tension on the back frame. There are numerous important structural features in the various elements.

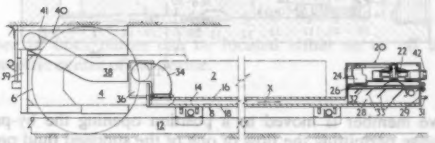
3,700,283
MATERIAL CARRIER
Bert A Birdsall, Mondamin, Iowa
Division of Ser. No. 752,843, Aug. 15, 1968, Pat. No. 3,572,643, which is a division of Ser. No. 527,947, Feb. 16, 1966, Pat. No. 3,412,883. This application Aug. 10, 1970, Ser. No. 62,355
Int. Cl. B60p *1/36*
U.S. Cl. 298—7 **2 Claims**



A material carrier movable over the ground and having wall structure of changing dimensions to provide an increasing dimension flow path to facilitate downward flow of material to a trough and discharge opening and with structure for tilting of the carrier relative to the supporting frame.

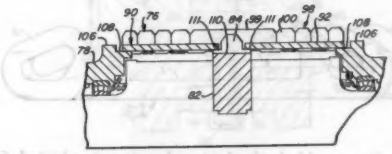
ERRATUM
For Class 299—5 see:
Patent No. 3,700,280

3,700,284
UNDERFRAMES FOR LONGWALL MINERAL MINING MACHINES
James Malcolm Agnew, Burton-upon-Trent, England, assignor to Coal Industry (Patents) Limited, London, England
Filed June 28, 1971, Ser. No. 157,342
Claims priority, application Great Britain, July 17, 1970, 34,829/70
Int. Cl. E21c *35/22*
U.S. Cl. 299—46 **9 Claims**



An underframe for a longwall mineral mining machine has a hollow deck which forms a guide duct for dust laden air which is drawn from the region around the cutter head and passed via the guide duct to a layer of filter material which removes the dust before the relatively dust free air is discharged into the mine atmosphere.

3,700,285
CUTTER CHAIN SUPPORT MEANS
Lester G. Rollins, 650 Forest Lane, Franklin, Pa.
Division of Ser. No. 786,649, Dec. 24, 1968, abandoned. This application May 5, 1971, Ser. No. 140,500
Int. Cl. E21c *27/24*
U.S. Cl. 299—83 **11 Claims**



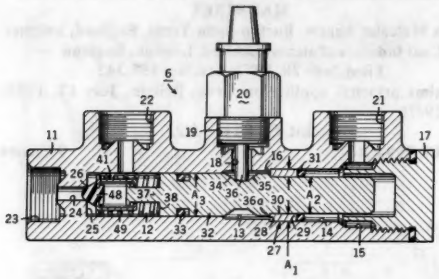
A cutter chain support means and more particularly a mining apparatus supporting a cutter chain for dislodging mineral from a solid mined vein.

ERRATUM
For Class 299—18 see:
Patent No. 3,700,849

3,700,286
CONTROL VALVE
Richard C. Bueler, Glendale, Mo., assignor to Wagner Electric Corporation, Newark, N.J.
Filed March 26, 1970, Ser. No. 22,903
Int. Cl. B60t *17/22, 11/34*
U.S. Cl. 303—6 C **8 Claims**

A control valve for use in a dual or split braking system which has a proportioning valve therein generally operable to proportion the fluid pressure in one of the systems. The control valve is provided with a shuttle or warning piston movable from a normally centered position to opposed translated posi-

tions in response to a predetermined differential between the separate supplied fluid pressures in said systems acting thereon. A by-pass passage is provided in the control valve connected in by-pass relation with the proportioning valve, and a valve member is normally urged toward a position closing said by-pass passage. A lost motion connection is defined between the shuttle piston and valve member wherein said



valve member is moved to a position opening the by-pass passage permitting the flow of one of the supplied fluid pressures therethrough in by-pass relation with the proportioning valve to obviate the proportioning function thereof upon the movement of the shuttle piston to one of its translated positions. It is also contemplated that the control valve can include the proportioning valve.

3,700,287

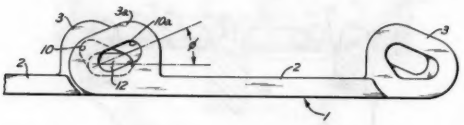
TREAD MEMBER AND ENDLESS TRACKS MADE THEREFROM

William J. Persin, Coraopolis, Pa., assignor to Baychem Corporation, New York, N.Y.

Filed June 25, 1971, Ser. No. 156,777

Int. Cl. B62d *55/22*

U.S. Cl. 305—38 **8 Claims**



A one-piece molded plastic tread segment adapted for coupling with an identical tread segment without distortion of either member which comprises a one-piece body portion having a recessed opening defined by integral walls and adapted to receive the teeth of a driving means, said body portion having extending from either end thereof a plurality of tongue members, the area between any two tongue members defining a clevis area adapted to receive the tongue members of another identical member, each tongue member having an aperture molded therein and extending completely therethrough in a transverse direction, the configuration of the aperture of two of the tongue members, each of which is located at the extremities of and on opposite sides of the body portion, being such as to conform with the cross section of a pin, said cross section of said pin being substantially elliptical, said aperture in said tongue member being disposed such that it forms a predetermined angle ϕ along its major axis in relation to the horizontal plane of the body portion, the configuration of the apertures of the remaining or inner tongue members being substantially triangular such that a certain degree of rotational freedom is permitted said pin when inserted through said apertures. Endless tracks produced by the cooperative engagement of a plurality of tread members are especially suited for use on tracked vehicles, such as for example, snowmobiles.

3,700,288

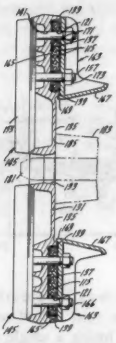
PAVING MACHINE

Donald R. Davin, Shelbyville, and Gary H. Beckley, Mattoon, both of Ill., assignors to Blaw Knox Constuction Equipment, Inc., Mattoon, Ill.

Filed Dec. 31, 1969, Ser. No. 889,542

Int. Cl. B62d *55/24*

U.S. Cl. 305—38 **10 Claims**



An asphalt paving machine mounted on rubber tread tracks. Each track is equally tensioned hydraulically. Each track is made of shoes which are individually connected to band sections. Replaceable rubber inserts are fastened to each shoe. Replaceable retains connected to each shoe engage bogie wheels which are attached to bogie carriages pivotally mounted on a torsionally flexible machine frame. A drive sprocket for each track is directly driven by a separate hydrostatic transmission with the sprocket supporting the track shoes and bands to maintain a constant pitch diameter for the track. The gear train between the hydrostatic motor and the sprocket is completely enclosed. A manual automatic engine speed control system is provided which automatically brings the paving machine engine to idle speed when the paving machine is stopped and brings the engine to its governed speed whenever the paving machine is moved. A closed center hydraulic system supplies fluid to operate power actuators.

3,700,289

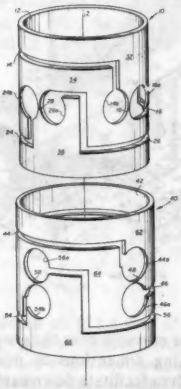
FLEXURE HINGE ASSEMBLY

Donald J. Bilinski, Randolph Township, Dover County, N.J., and Leon Weisbord, New York, N.Y., assignors to The Singer Company, New York, N.Y.

Filed April 15, 1970, Ser. No. 28,592

Int. Cl. F16c *11/12*; **G01c** *19/18*

U.S. Cl. 308—2 A **6 Claims**



A flexure hinge assembly wherein a pair of fixed telescoped tubular members are provided, each having one or more pairs

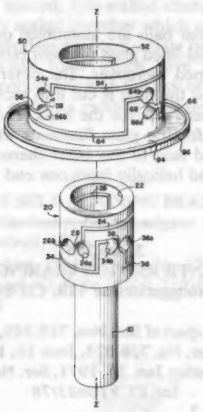
of axially spaced slots extending through their walls, the ends of one slot of each pair terminating a predetermined circumferential distance from the corresponding ends of the other slot of the same pair to form at least two flexure portions between the ends. The flexure portions of one of the tubular members extend parallel to the axes of the members, and the flexure portions of the other tubular member extend perpendicular to the axes of the members. A method of manufacturing a flexure hinge assembly.

3,700,290

FLEXURE HINGE ASSEMBLY

Willis B. Ensinger, Silver Spring, Md., assignor to The Singer Company, New York, N.Y.

Filed April 5, 1971, Ser. No. 131,014
Int. Cl. G01c *19/22*; F16c *29/00*
U.S. Cl. 308—2 A **3 Claims**



A flexure hinge assembly consisting of a pair of fixed telescoped tubular members, each having two pairs of slots extending through the walls thereof, the slots of one pair being axially spaced from the slots of the other pair to form a first and second gimbal portion adapted for connection relative to a drive member and a driven member, respectively, and a third gimbal portion extending between the first and second gimbal portions. Holes are formed at the ends of each slot, with the holes of one slot of each pair terminating a predetermined circumferential distance from the corresponding holes of the other slot of the same pair to form flexure portions between the holes which provide effective connections between the gimbal portions while permitting movement of each of the first and second gimbal portions relative to the third gimbal portion about predetermined coordinate axes. A stop member is connected relative to two of the gimbal portions to limit the relative angular deflection between the gimbal portions.

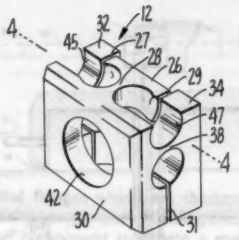
3,700,291

TWO DEGREE INVERTED FLEXURE

Wayne O. Hadland, San Jose, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 29, 1971, Ser. No. 193,671
Int. Cl. F16c *11/00*
U.S. Cl. 308—2 A **6 Claims**

An inverted flexure is provided having two degrees of freedom which can be made from a single block of material by simple drilling and sawing operations. The flexural axis of



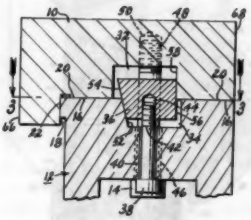
either or both planes can be located either on or off the geometric center of the device.

3,700,292

APPARATUS FOR SECURING AND ALIGNING TWO ELEMENTS WITH RESPECT TO EACH OTHER IN ORTHOGONAL PLANES

William A. Owens, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed May 28, 1971, Ser. No. 147,960
Int. Cl. F16c *23/00*
U.S. Cl. 308—3 A **4 Claims**



An apparatus secures and aligns distinct elements in two orthogonal planes. Each of said elements contains a key slot designed to accept a locating means when the desired surfaces of the elements are engaged with each other. The locating means is a key member that fits loosely in the slots wherein one wall of the key member forms a plane that obliquely passes through the plane of the desired surfaces and another wall of the key member engages the edge of the slot of one of the elements in a manner causing lateral movement of the elements with respect to each other when the key member is adjusted to move in a direction perpendicular to said lateral movement.

3,700,293

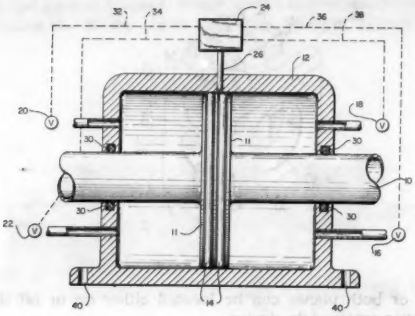
PISTON TYPE THRUST BEARING

James F. Dray, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 7, 1971, Ser. No. 132,015
Int. Cl. F16c *17/16*
U.S. Cl. 308—9 **2 Claims**

The invention is a piston type thrust bearing wherein the

rotating shaft has a radially extending plate attached thereto which defines a piston in a cylinder having fluid pressure act-



ing axially on opposite sides of said piston to absorb thrust loads.

3,700,294

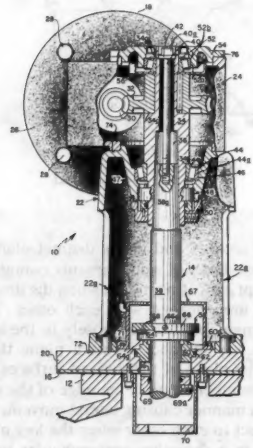
SHAFT SUPPORT AND SEAL

John J. Lennon, Winchester, Mass., assignor to Nettco Corporation, Everett, Mass.

Filed April 21, 1971, Ser. No. 135,846

Int. Cl. F16c *33/74*

U.S. Cl. 308—36.1 **5 Claims**



The inventions relates to a drive unit for rotating a shaft that extends into an enclosure and is sealed thereto by a conventional rotary seal. The shaft is supported by a bearing disposed a short distance from the seal so that oscillatory or pendulum-like movement of the shaft about the bearing as a center of rotation results in minimal radial displacement of the seal. The shaft is fabricated in two mating sections, an outer one connected to the supporting bearing and the inner one carrying the rotary seal. The inner shaft section can be axially displaced to separate the two sections for replacement of the seal without disturbing the bearing or other parts of the drive unit.

3,700,295

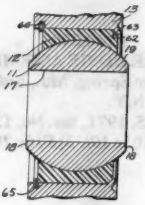
BALL AND SOCKET BEARING

Neil W. Butzow, Greendale, and Bernard Harris, Milwaukee, both of Wis., assignors to Rex Chainbelt Inc., Milwaukee, Wis.

Division of Ser. No. 826,565, May 21, 1969. This application Dec. 3, 1971, Ser. No. 208,026

Int. Cl. F16c *23/04, 33/20*

U.S. Cl. 308—72 **3 Claims**



Identical or similar balls are assembled on an arbor and a low-friction material-lined glass filament reinforced hardened epoxy tube is formed thereover. The outer diameter of the tube is finished and the tube is cut into sections to comprise the sockets or outer races for the balls. The socket or outer race includes reinforcing glass filaments which extend helically from one end face to the other thereof and other filaments which extend helically from one end face to the outer surface thereof.

3,700,296

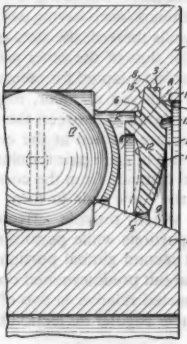
ANTIFRICTION BEARING

Ernst Bugmann, Honggerstrasse 118, CH-8037 Zurich, Switzerland

Continuation-in-part of Ser. Nos. 719,249, April 5, 1968, abandoned, and Ser. No. 738,023, June 18, 1968, abandoned. This application Jan. 15, 1971, Ser. No. 106,670

Int. Cl. F16c *33/78*

U.S. Cl. 308—187.2 **13 Claims**



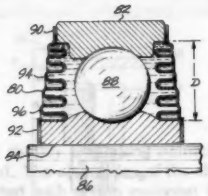
An antifriction bearing having radially spaced outer and inner races is provided with a polyurethane seal having glass fibers dispersed randomly therein between the races, the seal being an annulus which has an arcuate shaped body in longitudinal cross-section with its concave surface facing the interior of the bearing, an outer peripheral edge adapted to fit snugly in the outer race and an inner circumferential edge pressed against the surface of the inner race.

3,700,297

FLEXIBLE OSCILLATORY MOTION BEARING SEAL

Frederick I. Fickenwirth, Seattle, and Jan W. Van Wyk, Kirkland, both of Wash., assignors to The United States of America as represented by the Administrator of the Federal Aviation Administration

Filed Nov. 24, 1969, Ser. No. 879,474
Int. Cl. F16c *33/78*; F16j *15/50*
U.S. Cl. 308—187.2 **9 Claims**



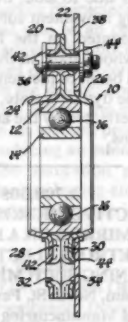
An antifriction bearing assembly and seal installation for oscillatory motion about a longitudinal axis comprising a pair of longitudinally spaced, thin-walled elastomeric seals defining a hermetically sealed chamber which contains fluid lubricant. The seal comprises an intermediate portion having a plurality of bellows-like folds which have a pair of parallel straight portions concentric with the axis of rotation and interconnected at one end by a radially directed semicircular segment.

3,700,298

ADJUSTABLE SELF-ALIGNING BEARING MOUNT

Charles N. Hay, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1971, Ser. No. 174,053
Int. Cl. F16c *23/00*, *23/08*
U.S. Cl. 308—194 **6 Claims**



An adjustable self-aligning bearing mount in which a bearing is clamped in a pillow block formed by a pair of flanged housing halves having abutting helically ramped faces so that these housing halves can be axially adjusted to the proper straddle for a particular bearing.

3,700,299

ROLLING BEARINGS

Robert S. Batt, Barby, near Rugby, England, assignor to The Torrington Company Limited, Conventry, England

Filed Aug. 30, 1968, Ser. No. 756,449
Claims priority, application Great Britain, Sept. 2, 1967, 40,202/67; Feb. 9, 1968, 6,554/68
Int. Cl. F16c *13/00*, *33/00*
U.S. Cl. 308—212 **4 Claims**

This invention relates to bearing races and bearing cages which are made of material which is initially in sheet form and which is subjected to such operations as pressing, rolling and deep drawing in order to shape it into its final configuration and in such a bearing component the invention provides one

or more radial flanges which are thickened relative to the remainder of the component by folding over upon itself an end region of the component to create a multiple thickness of material constituting a flange.

ERRATUM

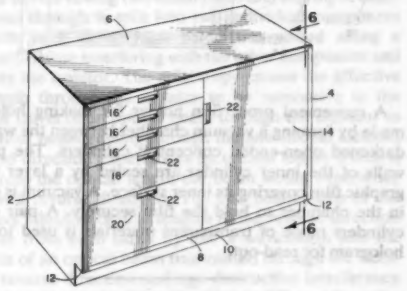
For Class 308—216 see:
Patent No. 3,700,845

3,700,300

MODULAR CABINET CONSTRUCTION

Donald A. Davis, Winchester, and Anthony Galluzzo, Woburn, both of Mass., assignors to The Schwamb Corporation, Arlington, Mass.

Filed Sept. 29, 1970, Ser. No. 76,505
Int. Cl. A47b *85/00*, *43/00*, *47/00*
U.S. Cl. 312—240 **10 Claims**



Modular cabinet construction wherein cabinet components, such as drawers, interior dividers, shelves, and exterior doors can be interchanged easily and quickly to convert the cabinet from all drawer type storage to all cupboard type storage, or to practically any desired combination of the two. The doors and interior dividers are mounted on the cabinet by resiliently biased pins or bolts, retraction of which permits removal of these members for converting the cabinet as desired. Drawer stop assemblies are provided on drawer guide members for preventing complete withdrawal of the drawers from the cabinet, with such assemblies being resiliently biased and adapted to be cammed out of the way to permit removal of the drawer for rearrangement thereof in the cabinet or for converting the cabinet into cupboard type storage.

3,700,301

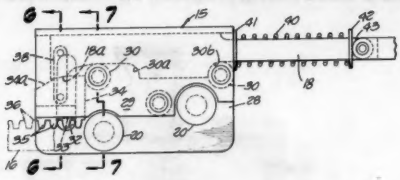
SELF-LOCKING LATCH MECHANISM

Gunther A. Boeck, Northridge, Calif., assignor to Keystone Engineering Company, Los Angeles, Calif.

Filed Oct. 19, 1970, Ser. No. 81,927
Int. Cl. A47b *88/16*
U.S. Cl. 312—333 **15 Claims**

A self-locking positive latch mechanism for use between a pair of relatively slidable structures for holding the latter

selectively in any one of many different positions. Spring



means function to hold the parts in their normal positive locking position except when manually held unlocked.

3,700,302

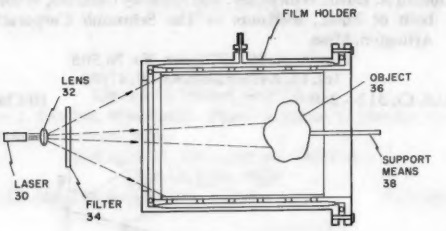
VACUUM FILM HOLDER FOR HOLOGRAMS

Windell N. Mohon, Winter Park, and Alfred H. Rodemann, Maitland, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy

Filed May 27, 1971, Ser. No. 147,558

Int. Cl. G03b *27/60*

U.S. Cl. 350—3.5 **1 Claim**



A movement proof film holder for making holograms is made by forming a vacuum chamber between the walls of two darkened open-ended concentric cylinders. The perforated walls of the inner cylinder are sealed by a layer of photographic film covering its inner surface. A vacuum is generated in the chamber to hold the film securely. A pair of similar cylinders made of transparent materials is used to hold the hologram for read-out.

3,700,303

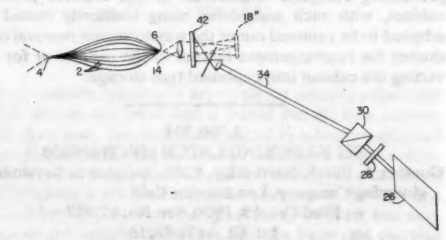
EFFICIENT ILLUMINATION OF THE CORES ONLY OF A FIBER OPTIC BUNDLE USING HOLOGRAPHY

Luther W. Smith, Brimfield, and Elias Snitzer, Wellesley, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed May 19, 1971, Ser. No. 144,762

Int. Cl. G02b *27/00*

U.S. Cl. 350—3.5 **2 Claims**



Holographic method of recording and reconstructing a wavefront, from an array of light spots on a dark field, to propagate the reconstructed wavefront so as to illuminate the light spots to the exclusion of the dark field.

3,700,304

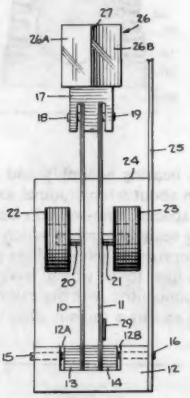
OPTICAL SWITCH MECHANISM

Frank Dostal, and Charles Badowski, both of New York, N.Y., assignors to Bulova Watch Company, Inc., New York, N.Y.

Filed Aug. 3, 1970, Ser. No. 60,249

Int. Cl. G02b *17/00*

U.S. Cl. 350—6 **9 Claims**



An optical switching mechanism including a vibrator having a pair of parallel reeds which are sustained in vibration at a rate determined by the resonance characteristic of the vibrator, the free ends of the reeds being ganged together by a headpiece. The arrangement is such that as the reeds sway simultaneously from side to side, the headpiece is caused to undergo a translating movement substantially free of an arcuate component. Mounted on the headpiece is a triangular reflecting element whose apex, in the static state of the vibrator, is aligned with a beam of incident radiant energy, whereby as the element, in the dynamic state, shifts to either side of the beam, the beam is deflected by the angled faces of the element in alternate directions.

3,700,305

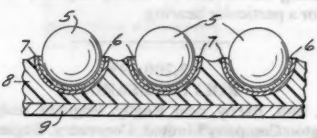
RETROREFLECTIVE MICROSPHERES HAVING A DIELECTRIC MIRROR ON A PORTION OF THEIR SURFACE AND RETROREFLECTIVE CONSTRUCTIONS CONTAINING SUCH MICROSPHERES

Wallace Karl Bingham, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 14, 1970, Ser. No. 97,660

Int. Cl. G02b *5/12*

U.S. Cl. 350—105 **11 Claims**



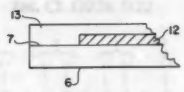
Retroreflective constructions containing microspheres with adjacent dielectric mirrors. Also microspheres having a plurality of coatings on a portion of their surface to form a dielectric mirror thereon.

3,700,306

ELECTRO-OPTIC SHUTTER HAVING A THIN GLASS OR SILICON OXIDE LAYER BETWEEN THE ELECTRODES AND THE LIQUID CRYSTAL

James V. Cartmell; Donald Churchill, both of Dayton, and Donald E. Koopman, West Carrollton, all of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Sept. 22, 1971, Ser. No. 182,819
Int. Cl. G02f 1/16
U.S. Cl. 350—150 12 Claims



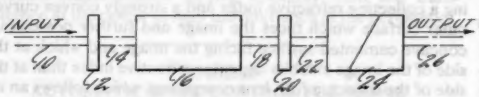
An electro-optic shutter employing nematic liquid crystal material is disclosed. The electrodes of the shutter of this invention are protected with a thin overcoat of an insulating material such as glass. This thin overcoat essentially prevents rapid electrode failure due to conduction of current through the liquid crystal material.

3,700,307

ADJUSTABLE NONLINEARLY TRANSMISSIVE OPTICAL DEVICE

William H. Glenn, Vernon, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed April 5, 1971, Ser. No. 131,327
Int. Cl. G02f 1/24
U.S. Cl. 350—157 4 Claims



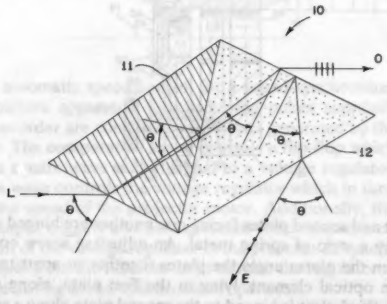
A nonlinear optical device which is useful because of its intensity-dependent transmissivity characteristic for Q switching or mode locking lasers and also as an optical limiter is disclosed. A combination of adjustable optical elements each of which causes a known effect on the polarization of radiation passing therethrough forms the device; one of these elements is a dielectric material which rotates the major axis of elliptically polarized radiation in an amount proportional to the intensity of the radiation, producing an intensity sensitive transmissive characteristic. The saturation parameters of the devices are variable and devices having either a saturable absorber or a saturable transmitter characteristic are described.

3,700,308

LIGHT POLARIZING PRISM OF ZIRCON

Van O. Nicolai, 11653 1B Northshore Drive, Reston, Va.

Filed March 22, 1971, Ser. No. 126,729
Int. Cl. G02b 5/30
U.S. Cl. 350—157 1 Claim



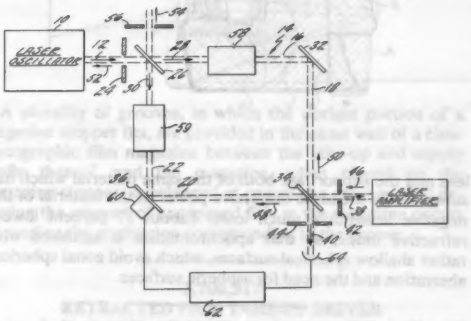
A laser beam splitting polarizer is constructed of zircon. Zircon can give about a 90° spread between the ordinary and extraordinary rays and is rugged enough to withstand high powered laser beams.

3,700,309

NONRESONANT INTERFEROMETRIC OPTICAL ISOLATOR

Michael L. Skolnick, West Hartford, and Carl J. Buczek, Manchester, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed March 15, 1971, Ser. No. 124,137
Int. Cl. G02b 27/00
U.S. Cl. 350—163 6 Claims



A nonresonant interferometric optical isolator is provided with an element having an index of refraction anisotropy. The isolator is a device having two beam paths and any input beam which passes through is split into two individual component beams, with each component being transmitted along a separate path before interfering with the other component and exiting from the isolator. The anisotropy causes the effective optical length through the isolator to be responsive to the direction of travel of an optical beam through the element so that an optical beam passing through the anisotropic element in a forward direction experiences an optical length which is different from the optical length the beam would experience traveling in a reverse direction. The two beam paths of the isolator have effective optical lengths in the reverse direction which differ from each other by half a wavelength and the components of an optical beam transmitted through the isolator in the reverse direction undergo destructive interference and leave the isolator along a path which is different from the input beam direction. Therefore, an input beam of optical energy is readily transmitted through the isolator in the intended direction, but any feedback beam passes through the isolator in a reverse direction and exits the isolator along a path which is different from the input beam direction.

3,700,310

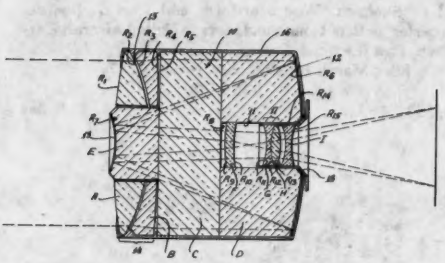
COMPACT CATADIOPTRIC APOCHROMAT SYSTEM

Juan L. Rayces, Santa Ana, Calif., assignor to The Perkins-Elmer Corporation, Norwalk, Conn.

Filed Sept. 10, 1971, Ser. No. 179,367
Int. Cl. G02b 17/08
U.S. Cl. 350—201 10 Claims

A highly corrected compact optical system which has a large telephoto ratio, and which is particularly adapted for a photographic objective, is provided by a catadioptric system consisting of a solid refractive support which has a portion of smaller diameter projecting from its forward end and internal reflecting surfaces on its opposite end. An annular convergent reflecting surface on the rear end of the support reflects incoming light back through the support to a circular divergent reflecting surface which is on the forward end of the forwardly projecting portion and which reflects the light back through the opening at the center of the annular reflecting surface where a series of lenses are suitably provided for increasing the focal length of the system and correcting for some aberra-

tions. Light enters the system through an afocal doublet at the front of the system consisting of a positive lens in front of a negative lens with an air space between; this doublet has an axial aperture through it and is positioned at the front of the support, around the forwardly projecting portion. The positive



lens and the support are both of the same material which has substantially the same dispersive power as the material of the negative lens but a much lower (about 17 percent lower) refractive index, so that apochromatism is achieved with rather shallow spherical surfaces, which avoid zonal spherical aberration and the need for aspheric surfaces.

3,700,311

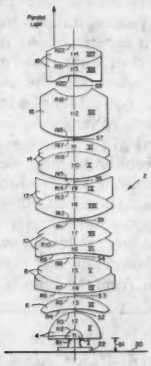
EIGHT COMPONENT 100X MICROSCOPE OBJECTIVE

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 22, 1971, Ser. No. 200,688

Int. Cl. G02b *21/02*

U.S. Cl. 350—214 **2 Claims**



An eight component apochromatic oil immersion microscope objective having a magnification of substantially 100X and a numerical aperture of substantially 1.30.

3,700,312

WIDE-ANGLE OBJECTIVE

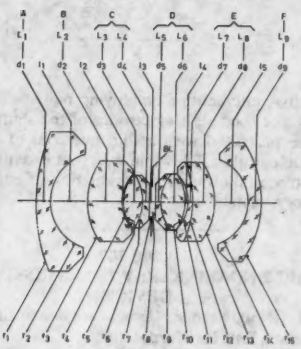
Ludwig Bertele, Heerbrugg, Switzerland, assignor to Firma Wild Heerbrugg AG, Heerbrugg, Switzerland

Continuation-in-part of Ser. No. 816,218, April 15, 1969. This application Oct. 14, 1971, Ser. No. 189,263

Int. Cl. G02b *9/62*

U.S. Cl. 350—215 **5 Claims**

A wide-angle objective composed of six components separated from each other by air spaces and located three at the object side of the diaphragm and three at the image side of such diaphragm, said six lens components taken in consecutive order from the side of the object comprising: a first lens component composed of one or more dispersing meniscus lens members curved towards the object side; a second lens component which follows a larger air space composed of a meniscus lens component curved towards the object side; a third lens component which follows an air space and possessing a collecting refractive index and having a strongly convex curved outer surface facing the object side and further having a concave cemented surface facing the object side which at the side of the object possesses a greater refractive



index than at the image side; a fourth lens component which follows the diaphragm space, said fourth lens component having a collecting refractive index and a strongly convex curved outer surface which faces the image and further possesses a concave cemented surface facing the image and which at the side of the image exhibits a greater refractive index than at the side of the object; a fifth lens component which follows an air space and comprising a meniscus lens component which is curved towards the image and assembled from at least one dispersing and collecting lens and; a sixth lens component which follows a larger air space and composed of one or more dispersing meniscus lens members curved towards the image.

3,700,313

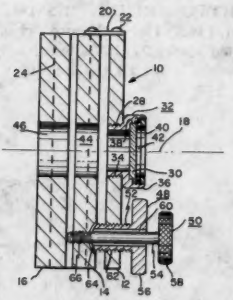
COAXIALLY ADJUSTED OPTICAL MOUNT

Lawrence J. Karr, Venice, and Norman Fried, Los Angeles, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 27, 1971, Ser. No. 212,525

Int. Cl. G02b *5/08*

U.S. Cl. 350—288 **6 Claims**



First and second plates facing one another are hinged at one edge by a strip of spring metal. An adjusting screw coupled between the plates urges the plates together or apart to position an optical element, lying in the first plate, along a first axis. A third plate is hinged to the second plate along a second

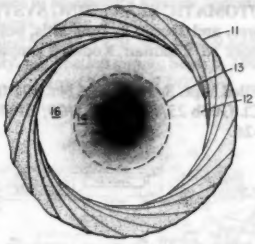
edge 90° to the first edge. A second adjusting screw coaxial with the first one couples the second and third plates together for positioning the optical element along a second axis 90° to the first axis.

3,700,314

VARIABLE LIGHT TRANSMITTING FILTER FOR CAMERAS

Edwin S. Busby, Jr., Menlo Park, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed April 7, 1971, Ser. No. 131,996
Int. Cl. G02b 5/22
U.S. Cl. 350—314 **3 Claims**



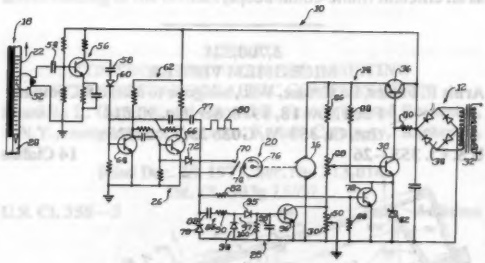
A filter for permanent installation to extend the effective range of iris openings of a camera; the filter has light transmittance characteristics varying smoothly from low transmittance at the center to high transmittance at the periphery.

3,700,315

AUTOMATIC SPEED CONTROL FOR MOVIE PROJECTOR

Edward B. Bernhold, Wheaton, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 16, 1970, Ser. No. 98,504
Int. Cl. G03b 31/04
U.S. Cl. 352—17 **4 Claims**



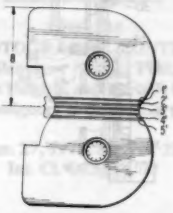
An automatic speed control for a sound-synchronized motion picture apparatus. Synchronizing pulses supplied by a tape recorder are compared with pulses generated by the projector. The comparative signal controls a flip-flop which supplies a square wave output signal to a voltage regulator. The square wave controls the voltage regulator which in turn controls the speed of the projector motor. Additionally, the flip-flop output triggers a switching means which shunts a control element of the voltage regulator in the presence of synchronizing pulses from the recorder so as to raise the regulator output voltage during sound-synchronized operation.

3,700,316

CINEMATOGRAPHIC FILM MAGAZINE

Taichi Kurechi, Ashigara-Kamigun, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sept. 3, 1971, Ser. No. 177,722
Claims priority, application Japan, Sept. 3, 1970, 45/87802
Int. Cl. G03b 23/02, 1/60
U.S. Cl. 352—78 C **2 Claims**



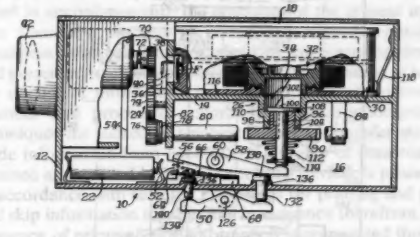
A plurality of grooves, in which the upright portion of a magazine stopper fits, are provided in the outer wall of a cinematographic film magazine between the take-up and supply shafts thereof, and the magazine, when placed on the magazine stopper, is balanced at one of the grooves, and detecting the amount of unexposed film in the magazine occurs by reading the graduation corresponding to the groove.

3,700,317

RETRACTED FILM TAKE-UP DRIVER

Henry J. Koeber, Deerfield, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 26, 1970, Ser. No. 67,112
Int. Cl. G03b 1/04
U.S. Cl. 352—91 **7 Claims**



For use in a camera having film transported for take-up on a unidirectionally operable take-up member, a take-up drive selectively engageable with the member to rotate that member and connected to the camera drive so as to be rotated continuously during camera operation. For normal operation of the camera, a manually operable control actuates the camera motor energizing circuit and simultaneously moves the take-up driver into operative engagement with the film take-up member. When the control is released, the camera is de-actuated and the take-up is retracted. A second control is arranged to actuate the camera without engaging the take-up member with the take-up driver wherein exposed film accumulates in the film chamber but is not taken-up. This accumulated length of once exposed film is available for rewinding and re-exposure as is desirable in making lap dissolve sequences.

3,700,318

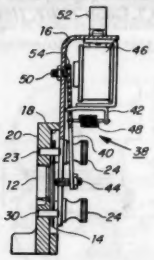
FILM GATE

Omar Leo Cunningham, Jr., La Jolla, Calif., assignor to Stromberg Datagraphix, Inc., San Diego, Calif.

Filed April 26, 1971, Ser. No. 137,406
Int. Cl. G03b 1/48
U.S. Cl. 352—225 **6 Claims**

An improved film gate for motion picture projectors, microfilm viewers and the like is disclosed. The film gate con-

sists essentially of rigid fixed platen and an arcuate spring platen. The platens have cooperating apertures corresponding to the film frame size. During film movement through the film gate the platens are spaced apart to serve as guides. While the



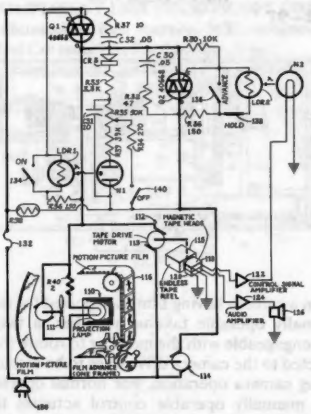
film is stopped for viewing, the spring platen presses the film against the fixed platen. The arcuate configuration of the spring platen provides rolling contact as it closes to prevent film damage.

3,700,319

CONTROL CIRCUIT FOR SINGLE FRAME FILM ADVANCE AUDIO PROJECTOR

Harold Gallina, Belleville, N.J., assignor to Optisonics Corporation, Montgomeryville, Pa.

Filed Jan. 12, 1971, Ser. No. 105,891
Int. Cl. G03b *31/00;* **H01j** *39/12;* **H03k** *3/42*
U.S. Cl. 353—15 **10 Claims**



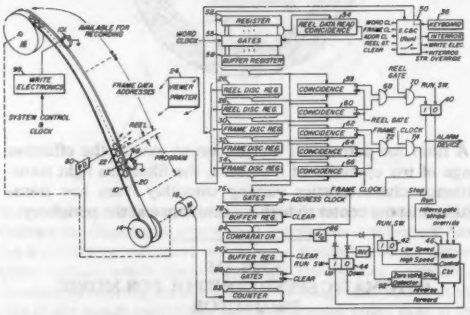
A control circuit for an audio-visual projector of the type wherein a dual track magnetic tape recording provides an audio presentation and control signal bursts for advancing a filmstrip in single frame sequence in predetermined synchronism with said audio presentation. The projector is turned on by manual operation of a momentary contact switch; this renders conductive a main semiconductive switch which energizes the projector lamp, the tape drive motor, and, via a diode, a first circuit control bulb and a storage capacitor in parallel with said bulb. Light from the bulb is sensed by a first photoconductor in parallel with the manual switch. The first photoconductor assumes a lowered impedance, thereby to maintain the main semiconductive switch (and hence the projector lamp, tape drive motor, and first bulb) energized so that the first frame of the filmstrip is projected and the audio presentation is heard. Each burst from the control track of the audio tape advances the filmstrip one frame as follows: the burst (after amplification) briefly energizes a second circuit control bulb; this illuminates (and lowers the impedance of) a second photoconductor, thereby to render conductive a second semiconductive switch which energizes the projector's geneva film drive mechanism. The second semiconductive switch shunts the first circuit control bulb and diode but does not extinguish the first bulb when turned on briefly because the capacitor, having been charged, supplies current to maintain the first bulb on during film advance intervals. However at the end of the audio visual presentation, a long control burst is provided which turns on the second semiconductive switch long enough to cause the capacitor's charge to dissipate, whereby the first control bulb turns off, interrupting the latching action of the circuit associated with the main semiconductive switch so as to turn off the entire projector.

3,700,320

AUTOMATIC SEARCHING SYSTEM

Waldo L. Brewer, and Joseph F. Laukaitis, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 3, 1970, Ser. No. 69,201
Int. Cl. G03b *23/12;* **G11b** *5/00;* **G06k** *7/00*
U.S. Cl. 353—26 **7 Claims**



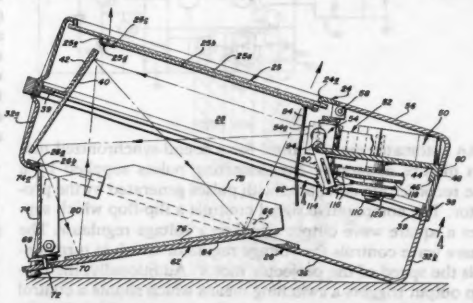
An automatic searching system, say for use with microfilm strips, hybridizes magnetic and optical searching techniques: Magnetically recorded descriptor data is not positioned relative to respective frames; and instead, magnetic frame address data is associated with descriptor data. A counter, under optical control, keeps track of frames which pass a reference (viewer) location; and a code-and-counter combination serves as an efficient frame-count keeper.

3,700,321

MICROFILM VIEWER

Arnis E. Peters, La Crosse, Wis., assignor to Micro 8 Company

Filed Nov. 18, 1970, Ser. No. 90,514
Int. Cl. 353 *78;* **G03b** *23/12, 21/28*
U.S. Cl. 353—26 **14 Claims**



A portable, compact viewer is provided for illuminating, enlarging and viewing microphotograph frames that are carrier

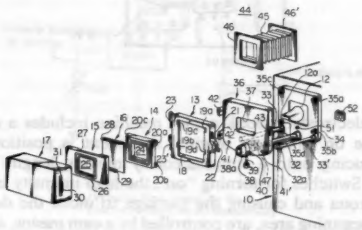
on a film strip pre-packaged in a cassette. An angled stand for the viewer carries one of the mirrors used in projecting the illuminated and enlarged image and provides shield means against random light entering the viewer. Simplified means are provided for selectively holding a film-containing cassette in proper optical position on the viewer and for releasing the cassette for focusing the lens means and for transporting the film in the cassette selectively in opposite directions, all without possibility of damage to the microphotograph-bearing portion of the film strip.

3,700,322

PHOTOGRAPHING ARRANGEMENT FOR USE WITH A CATHODE-RAY TUBE

Yasuyuki Morita, and Tsutomu Nishino, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Limited, Kadoma, Osaka, Japan

Filed Sept. 4, 1970, Ser. No. 69,648
Claims priority, application Japan, Sept. 5, 1969, 44/85646
Int. Cl. G03b *27/00*
U.S. Cl. 355—1 **5 Claims**



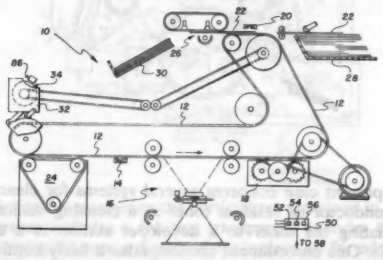
A method and arrangement for photographing optical images such as oscillographic waveforms displayed on a faceplate of a cathode-ray tube, wherein a glass fiber screen is attached to the faceplate to form a display surface at the leading end of the glass fiber screen and a sensitized photographic film is placed directly upon the display surface of the glass fiber screen so that the images on the display surface are photographed on the film without use of a lens or lenses interposed between the film and the faceplate. The contact pressure between the film and the display surface is in operation maintained at a desired constant value through detection and conversion into electrical signals of the contact pressure for direct reading of the contact pressure.

3,700,323

CONTROL CIRCUITRY FOR ASSISTING ELECTROSTATOGRAPHIC COMPENSATION

Franklin L. Guyette, and Donald R. Frank, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1971, Ser. No. 213,014
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **4 Claims**



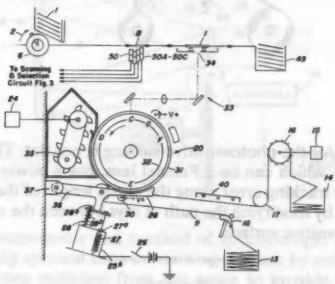
In an electrostatographic copying device of the type which utilizes a replaceable web having a particular sensitivity response which falls into one of a number of sensitivity response ranges, the particular sensitivity response range of each web being encoded thereon or on a cartridge in which the web is disposed, circuitry adapted to assist the control of any one of a number of operations to be performed with respect to a utilized web, in a manner which insures comparable copies when webs of differing sensitivity are employed from time to time.

3,700,324

ELECTROPHOTOGRAPHIC PRINTING SYSTEMS

Mark A. Hutner, Glenview; Neil A. Polit, Cary; Donald W. Watson, Arlington Heights, and Herbert C. Artelt, Jr., Wildwood, all of Ill., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 27, 1972, Ser. No. 221,229
Int. Cl. G03g *15/00*
U.S. Cl. 355—6 **23 Claims**



Improved electrophotographic printing systems are provided in accordance with the teachings of the present invention wherein a plurality of coded data records containing document information are scanned by code sensing devices and presented to electrophotographic imaging means at which the document information is imaged upon a photosensitive member and processed according to electrophotographic techniques for subsequent presentation to a transfer station. Code information from each of the plurality of data records scanned as provided by the code sensing devices is processed in accordance with selected conditions for printing and print and skip information is generated in sequence therefrom. The sequence of print and skip information is propagated through logic circuitry at a rate corresponding to the rate at which document information from each of the plurality of coded data records is electrophotographically processed in such manner that each bit of information in the print and skip information sequence is present at a predetermined output of the logic circuitry at a time when document information from the data record associated therewith is presented to the transfer station. At the transfer station, a transfer member which is normally maintained in a position displaced from the photosensitive member is continuously charged by an ion charging device and a transfer member assembly is provided to selectively bring the transfer member from its displaced position into a transfer relationship with the photosensitive member in response to the presence of a bit representing a print signal at the predetermined output of the logic circuitry.

3,700,325

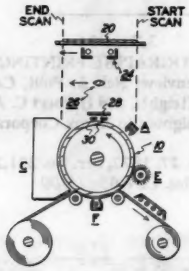
SCANNING OPTICAL SYSTEM FOR PHOTOCOPYING APPARATUS

David C. Harper, 233 Winona Boulevard, Rochester, N.Y.

Filed March 26, 1970, Ser. No. 22,936
Int. Cl. G03g *15/04*
U.S. Cl. 355—8 **15 Claims**

An optical system for forming and focusing a light image of an original onto a photosensitive surface by a scanning technique of exposing successive increments of the photosen-

sitive surface including a correcting lens that corrects any tracking error between a given point in the light image and its corresponding image point on the photosensitive surface which occurs perpendicular to the direction of scan when the



original and/or the photosensitive surface is not flat. The correcting lens, which can be a Fresnel lens, has a power which corrects the tracking error along the entire length of the exposure station by modifying the path of rays between the original and photosensitive surface.

3,700,326

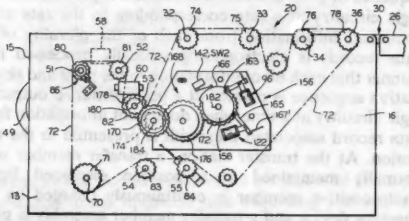
SWITCH CONTROL MEANS FOR A PHOTOCOPY MACHINE

Karl M. Murgas, Lincolnwood; Burton Greenberg, Skokie, and Otto A. Clark, Chicago, all of Ill., assignors to ICP, Inc., Skokie, Ill.

Continuation-in-part of Ser. No. 745,841, July 18, 1968, Pat. No. 3,597,074. This application Aug. 21, 1970, Ser. No. 65,769

Int. Cl. G03g *15/00*

U.S. Cl. 355—14 **7 Claims**



An electrostatic photocopy machine comprising an original document transport means having a sheet copier position for reproducing an original document sheet of substantially any length and a book copier position for reproducing a book or other type original document of substantial thickness. In either the sheet or book copier position, increments of a moving original document are produced onto a simultaneously moving length of copy paper. A movable book carrier is removably attached to the machine when the original transport means is in the book copier position.

Switch control means, including a cam driven by a continuous chain, is used to turn the corona and the high intensity lamp on and off.

3,700,327

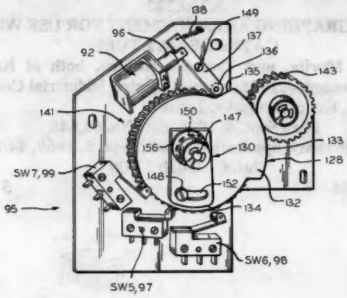
SWITCH CONTROL MEANS FOR AN ELECTROSTATIC BOOK COPIER MACHINE

Karl M. Murgas, Village of Lincolnwood, and Burton Greenberg, Village of Skokie, both of Ill., assignors to ICP, Inc., Skokie, Ill.

Continuation-in-part of Ser. No. 65,769, Aug. 21, 1970. This application March 18, 1971, Ser. No. 125,559

Int. Cl. G03g *15/00*

U.S. Cl. 355—14 **5 Claims**



An electrostatic book copier machine includes a movable carriage on which an original document is positioned, for reproducing onto a simultaneously moving length of copy paper. Switches for turning "on" the high intensity lamp and the corona and causing the carriage to move the document past a scanning area, are controlled by a cam means, activated after manually depressing a print button, and automatically activated when reproducing multiple copies.

3,700,328

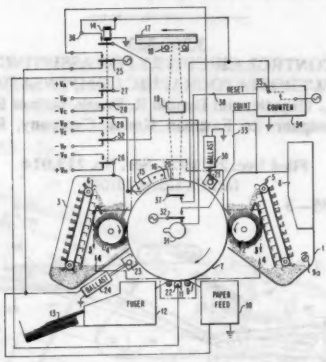
MAGNETIC BRUSH CLEANING SYSTEM

Ronald V. Davidge; Henry C. Locklar; James C. Ralston, and Robert T. Ritchie, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1971, Ser. No. 210,756

Int. Cl. G03g *15/00*

U.S. Cl. 355—15 **15 Claims**



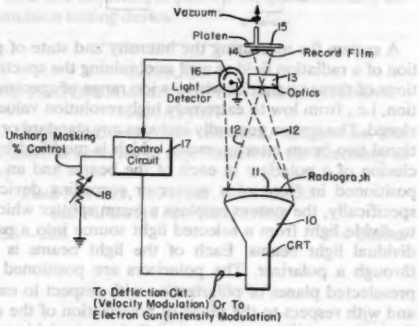
The present case concerns several systems for cleaning a photoconductor of residual toner at a cleaning station and recirculating the toner to a developer station in a copier machine. One embodiment contemplates a fairly continuous accumulation of residual toner in the cleaning unit and a periodic recirculation of the toner to the developer unit.

Another embodiment makes use of a cleaning station for performing cleaning of toner from an imaging portion of a photoconductor drum member and concurrent conveyance of residual toner from the cleaning station back to the developer station by another portion of the photoconductor. In still another version, recirculation is performed by augers. In some cases, recirculation is initiated by counter means operative after a predetermined number of cycles.

3,700,329
RADIOGRAPHIC REDUCTION SYSTEM

Robert P. Mason, Alexandria, Va., assignor to Log Etronics Inc., Springfield, Va.

Filed Aug. 2, 1971, Ser. No. 168,116
Int. Cl. G03b 27/78
U.S. Cl. 355—81 **8 Claims**

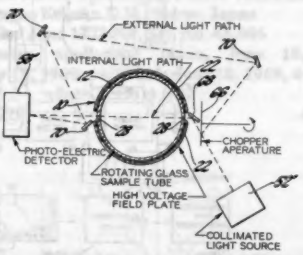


The density range existing in a reduced-size copy of a radiographic film is linearly compressed by a system employing a combination of electronic unsharp masking cooperating with a dual-gradient record film. Image densities in the original radiograph between a range of 0 and approximately 2.0 are recorded on the higher contrast gradient portion of the record film characteristic, and are subjected to unsharp masking over the range of said higher gradient portion. Image densities in the radiograph in excess of about 2.0 are recorded, without masking, on the lower contrast gradient portion of said record film.

3,700,330
ELECTRO-OPTICAL VEHICLE EXHAUST PARTICULATE MONITOR

Roger C. Davis, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 13, 1971, Ser. No. 188,849
Int. Cl. G01n 1/00, 15/02, 21/12
U.S. Cl. 356—38 **3 Claims**

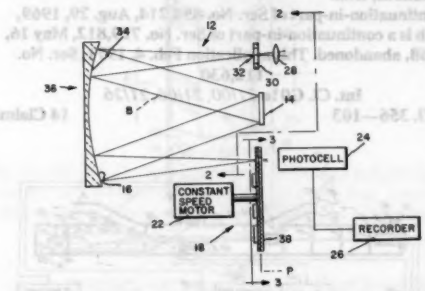


A device for measuring the particulates entrained in a gaseous stream includes a rotating transparent cylinder through which the gases pass, a supply of dry ionized air for admixture with the gaseous stream to charge the particles entrained in the stream and a pair of electrodes adjacent the rotating cylinder for establishing an electrostatic field to precipitate the particles onto the cylinder wall. An optical scanning device then measures the collected particulate according to the attenuation of light beams passing through the cylinder wall.

3,700,331
SPECTROMETER WITH ROTARY SCANNING DISC AND METHOD OF SPECTROSCOPIC ANALYSIS

Peter G. White, Torrance, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Dec. 29, 1969, Ser. No. 888,385
Int. Cl. G01j 3/42, 3/12
U.S. Cl. 356—83 **11 Claims**

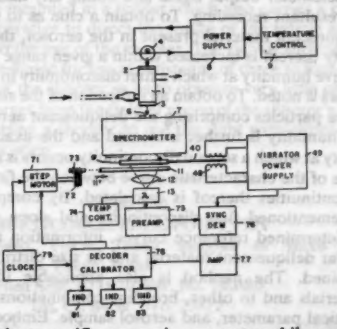


A spectrometer and method of spectroscopic analysis for providing spectral data concerning a scene by collecting and collimating radiation from the scene to provide a radiation beam dispersing the radiation of the beam into a spectrum, forming a focused image of the spectrum, scanning the spectrum image in rapid succession by multiple narrow radiation receiving areas, and generating an electrical output representing the radiant flux incident on each area during its relative scanning movement along the image. The spectrometer may be equipped with means for mounting radiation filters over selected radiation receiving areas to provide information concerning selected characteristics, such as relative polarization, of the radiation from the spectrum image and for mounting narrow band-pass calibration filters over alternate radiation receiving area to permit calibration of the spectral data obtained from the scene.

3,700,332
SPECTRAL ANALYSIS USING A MODULATING MASK TRANSMITTING SELECTED SPECTRAL LINES AND REFERENCE BANDS

John A. Decker, Jr., Concord, Mass., assignor to Comstock & Westcott, Inc.

Filed March 5, 1971, Ser. No. 121,283
Int. Cl. G01j 3/42, 3/36, 3/00
U.S. Cl. 356—97 **25 Claims**



For detecting specific gases in an automobile exhaust selected lines of the exhaust gas absorption spectrum and

reference bands of the spectrum close to the lines are chopped by a mask at the spectral plane so that the light flux from the lines and bands are transmitted at different times. The flux of the lines and bands are also encoded by the chopping mask or a successive encoding mask and applied to a single photodetector which produces a series of electrical values representing the flux of the selected spectral lines.

3,700,333

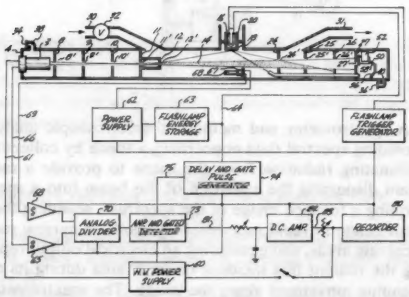
METHOD AND APPARATUS FOR MAKING AN IN-SITU DETERMINATION OF THE CHEMICAL PROPERTIES OF ATMOSPHERIC AEROSOLS

Robert J. Charlson, and Norman C. Ahlquist, both of Seattle, Wash., assignors to The Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 854,214, Aug. 29, 1969, which is a continuation-in-part of Ser. No. 729,812, May 16, 1968, abandoned. This application Feb. 4, 1971, Ser. No. 112,630

Int. Cl. G01n *21/00, 21/06, 21/26*

U.S. Cl. 356—103 **14 Claims**



An integrating nephelometer which provides an output signal proportional to the value of the extinction coefficient due to light scattering for a given sample of an atmospheric aerosol is described. A method for determining chemical and other properties of the aerosol sample using this nephelometer includes the steps of continuously varying some physical parameter of the aerosol sample while observing any change in the output signal provided by the nephelometer. In each case, a characteristic curve for the aerosol may be recorded over a range of values of the physical parameter, which curve identifies one or more properties of the aerosol, such as deliquescence, hygroscopicity, chemical composition, aerosol particle size distribution, and so forth. In one embodiment, the presence of deliquescent materials is ascertained by continuously varying the aerosol's relative humidity below a value of 100 percent while simultaneously recording the value of the nephelometer output signal and noting any discontinuities in the resultant recording. To obtain a clue as to the particular deliquescent material present in the aerosol, the relative humidity thereof is increased within a given range and the exact relative humidity at which a first discontinuity in the recording occurs is noted. To obtain an indication of the size distribution of the particles comprising the deliquescent aerosol, the relative humidity is further increased and the exact relative humidity at which a second discontinuity occurs is noted, and the slope of the characteristic curve between the first and second discontinuities thereof is calculated. By comparison of the aforementioned first discontinuity and slope with those of predetermined reference curves, information as to the particular deliquescent material and its size distribution may be obtained. The method is also applicable to hygroscopic materials and to other, broader, combinations of a reagent, physical parameter, and aerosol sample. Embodiments of apparatus for continuously varying the aerosol's relative humidity are also described.

3,700,334

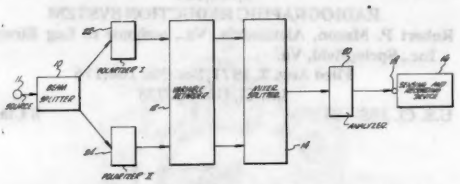
INTERFEROMETER-POLARIMETER

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Alain L. Fymat, San Marino, Calif., and Krishna D. Abhyankar, Hyderabad, India

Filed Nov. 13, 1970, Ser. No. 89,211

Int. Cl. G01b *9/02;* **G01n** *21/40*

U.S. Cl. 356—106 **7 Claims**



A system for measuring the intensity and state of polarization of a radiation field as well as obtaining the spectral variations of these quantities with a wide range of spectral resolution, i.e., from low to extremely high resolution values, is disclosed. The system generally includes any standard or conventional two-beam interferometer which is modified by the inclusion of a polarizer in each of the beams and an analyzer positioned in front of a sensor or recording device. More specifically, the system employs a beam splitter which serves to divide light from a selected light source into a pair of individual light beams. Each of the light beams is directed through a polarizer. The polarizers are positioned to have preselected planes of polarization with respect to each other and with respect to the plane of polarization of the analyzer. The polarized light beams are applied to a variable optical retarder which serves to selectively modify the relative optical path lengths of the light beams. An optical mixer may be employed to recombine the two light beams. The recombined light beams are projected through an analyzer, such as a linear polarizer, to a sensor or recording device.

3,700,335

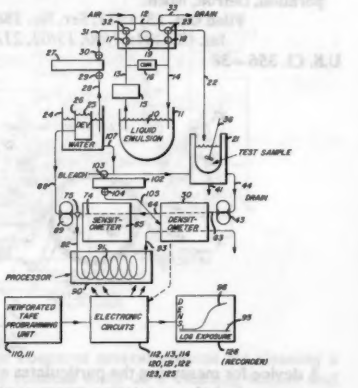
PROCESS AND APPARATUS FOR SENSITOMETRICALLY TESTING A LIQUID, PHOTOSENSITIVE EMULSION

David C. Seelbinder, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 21, 1971, Ser. No. 108,485

Int. Cl. C01n *21/22*

U.S. Cl. 356—201 **27 Claims**



A continuous process and system for measuring and relating the densities of a liquid photographic emulsion to determine its sensitivity. A test sample of the emulsion is diluted with a

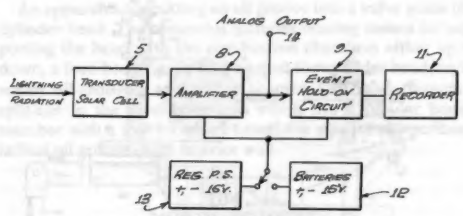
fixed amount of water before being moved and circulated in a predetermined flow path. A densitometer and sensitometer are arranged in the flow path, and the unexposed emulsion is first introduced into the densitometer so as to measure the density thereof, before processing, and then into the sensitometer in which the emulsion is exposed to radiation of continually varying intensity and of selected spectral quality. After being exposed, the emulsion is mixed with a suitable processing solution; and the processed emulsion is then returned to the densitometer wherein the density is again measured. A recorder plots a graph representative of the density measurements so that the sensitivity of the emulsion can be determined. The process and apparatus is continuous in its operation and sequence of operation through the medium of a program-control medium. Such a medium and its associated electronic circuitry provides the necessary control for actuating the various valves, pumps and other elements of the system in proper time and sequence to effect a complete and fully automatic emulsion testing device.

3,700,336

METHOD FOR OPTICALLY DETECTING LIGHTNING RADIATION

Robert J. Clegg, Auckland, New Zealand, assignor to The United States of America as represented by the Secretary of the Navy

Filed April 19, 1971, Ser. No. 134,933
Int. Cl. G01j *1/44*; H01j *39/12*
U.S. Cl. 356—226 **4 Claims**



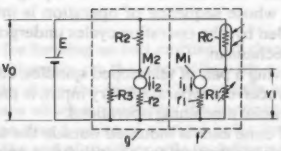
The apparatus detects the optical radiation of lightning in both daylight and nighttime conditions. A silicon solar cell receives light radiations converting them to electrical signals which are amplified and electronically processed for recording purposes. Preferably, the electronics provide a thresholding means to selectively pass signals representative of lighting events to the recorder while blocking the relatively constant background radiation representative of the daylight.

3,700,337

STRUCTURE OF EXPOSURE MEASURING DEVICE USING TWO GALVANOMETERS

Tatsuo Fujii, and Toshio Tomomitsu, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed June 12, 1970, Ser. No. 45,696
Claims priority, application Japan, June 18, 1969, 44/57010; June 18, 1969, 44/57011; June 18, 1969, 44/57012
Int. Cl. G01j *1/42*
U.S. Cl. 356—227 **4 Claims**



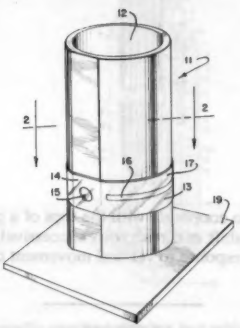
An electrical photo-exposure meter comprising at least one variable resistor operatively associated with an exposure factor whereby an accurate exposure free of any error resulting from a variation in the source voltage can always be obtained without checking the source voltage.

3,700,338

LIGHT SCATTERING CELL

Albert S. Trundle, Santa Barbara, Calif., assignor to The United States of America as represented by the Secretary of the Army

Filed June 9, 1970, Ser. No. 44,835
Int. Cl. G01n *1/10*
U.S. Cl. 356—246 **4 Claims**



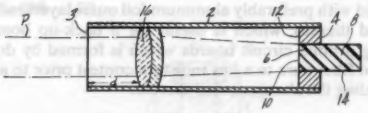
A light scattering cell for containing liquid samples or particulate samples suspended in a liquid comprising a tube having light entrance and exit apertures with optical surfaces formed from thin transparent disposable film. The entrance aperture is flat and normal to the incident light and the exit aperture is a portion of a cylinder whose axis is normal to the scattering plane and is at the center of the scattering volume.

3,700,339

GUN SIGHT

William F. Steck, III, El Paso, Tex., assignor to W. R. Weaver Company

Continuation-in-part of Ser. No. 130,677, April 1, 1971. This application June 29, 1971, Ser. No. 157,868
Int. Cl. F41g *1/00, 11/00*
U.S. Cl. 356—247 **4 Claims**



A sight for use with a firearm which sight includes a flourescent reticle mounted in a holder which also carries a collimating lens operative to direct the image of the reticle along parallel lines to the eye of the shooter. The sight is sufficiently small, and is designed for use at a distance of three to four feet from the eye of the shooter so as to obscure very little of the image of the target from the field of vision of the shooter's eye, thereby permitting a shooter to use the sight with either one eye or two eyes open.

3,700,340

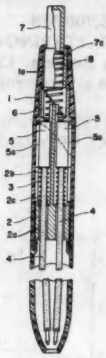
MULTICOLOR BALL-POINT PEN

Shingan Terasaki, Tokyo, Japan, assignor to Nikko Pen Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 8, 1970, Ser. No. 70,080
Int. Cl. B43k *5/16, 27/12*
U.S. Cl. 401—33 **5 Claims**

The present invention relates to a ratchet-type multicolor ball-point pen, the rotatable cylinder of which is rotated by

vertical movement of an actuating stem and which cylinder is provided with an inclined surface, a vertical surface, and a notch between said surfaces, said notch and inclined surface



being adapted to cooperate with the tops of a plurality of ink-reservoirs, and shift said reservoirs successively into the writing position in response to vertical movement of the actuating stem.

3,700,341

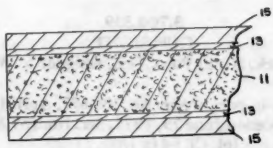
LAMINATED BOARD AND METHOD OF MAKING SAME

James P. Block, Long Beach, Calif., assignor to LCOA Laminating Company of America

Filed July 27, 1970, Ser. No. 58,230

Int. Cl. B23b *35/00*

U.S. Cl. 408—1 **2 Claims**



A laminated board formed of a core of pressed wood covered with preferably aluminum foil outer layers, adhesively bonded thereto, which is useful for a back-up board when drilling printed circuit boards which is formed by drying the pressed fiber core to a low moisture contest prior to adhesively bonding the aluminum foil thereto.

3,700,342

TOOL INFEEDING MECHANISM

John A. Cupler, II, 10 Cupler Drive, Cumberland, Md.

Division of Ser. No. 715,711, March 25, 1968, Pat. No. 3,478,419. This application Sept. 4, 1969, Ser. No. 871,133

Int. Cl. B23b *47/18*

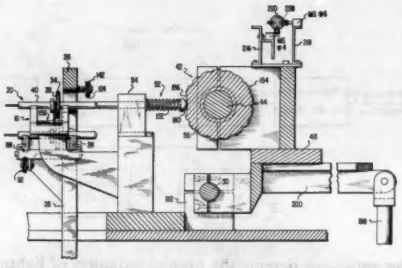
U.S. Cl. 408—17 **5 Claims**

The disclosure introduces a new concept in machining; that of the non-captive tool. A non-captive tool is herein defined as one which may undergo bodily movement, transversely of its own axis, relative to both the tool bearing structure which supports the tool in working position and a tool support structure which supports the tool in a non-working position adjacent the bearing structure. The non-captive tool is unrestrained against the aforesaid bodily movement except during that time the tool is actually working and, while working, the restraint imposed is due to engagement with the tool driving means. Accordingly, removal of the tool driving means from engagement with the tool frees the same for bodily movement which movement may, advantageously, be integrated with the movement of the tool driving means out of engagement with the tool.

The disclosure is directed to methods and apparatus for automatically interchanging a plurality of non-captive rotary tools between working and non-working positions; for effecting tool interchange concomitantly with respective engagement and disengagement of working and non-working tools with a constantly driven input; for effecting infinitely variable infeed of the working tools; for automatically positioning a workpiece in accordance with pre-programmed operating cycles controlling a tool changer; for performing machining operations with a tool having a compound rotary input; and for transmitting a programmed cycle of operation from a master machining console to a plurality of slave machining centers.

The working and non-working tools in accordance with a first aspect of the invention relating to a tool changer are non-captively supported, in a horizontal position, on Vee bearings and a tool support rack, respectively. The tools are mounted on spindles which are adapted to be supported adjacent their outer ends on the support rack and at an intermediate portion thereof on the bearings. The bearings are of the Vee type and provide non-captive support for the tool spindles supported thereon to permit both rotary and reciprocating movement of the tools. Relative vertical movement between the rack and bearings results in an interchange of tools therebetween by virtue of the tools being lifted from either the bearings or the rack, depending on the direction of vertical movement.

At least one flexible driving member is constantly recircu-



lated adjacent the bearings and is mounted for vertical movement with the tool support rack for movement into and out of driving engagement with the working tools simultaneously with the aforementioned tool interchanging operation.

A linearly reciprocable cam follower is mounted adjacent each tool bearing in coaxial alignment with that end of the tool spindle remote from the working end; whereby reciprocating and/or advancing movement of the followers will be transmitted through one end thereof to the working tools. An elongated cone cam is positioned to engage the other ends of the followers and reciprocate the same upon rotation of the cone. The cone is, additionally, mounted for axial translation to provide for controlled advance of the followers and tools engaged thereby. Simultaneous rotation and translation of the cone results in a constantly advancing reciprocating path of tool movement.

A work station is positioned adjacent each of the Vee bearings and includes a work clamping and indexing mechanism whose sequence of operation is integrated with, and controlled by, the operating cycles undergone by the tool changing mechanism.

A tool having a pair of telescoped spindles, each of which is adapted to receive a separate rotary input, is provided for use in certain special machining operations.

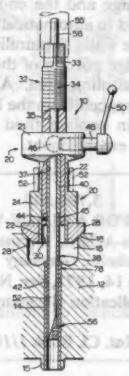
A second cone cam is mounted outside the confines of the tool changing mechanism for reciprocating one or a plurality of followers comprising the input to a closed hydraulic slave system whose output is adapted to actuate additional tools.

3,700,343

APPARATUS FOR PROVIDING OIL GROOVES IN VALVE GUIDES

John Parry, Orillia, Ontario, Canada, assignor to Ingenious Devices Limited, Orillia, Ontario, Canada

Filed Feb. 8, 1971, Ser. No. 113,389
Int. Cl. B23b *5/48, 5/08, 41/12*
U.S. Cl. 408—81 8 Claims



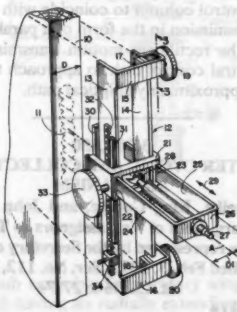
An apparatus for cutting an oil groove into a valve guide in a cylinder head. The apparatus includes bracing means for supporting the head with the combustion chambers either up or down, a feed body rigidly held against the cylinder head, and a rotary oil-grooving tool which is screw-fed down through a split-nut in the feed body and which has a tubular boring member with a tool bit which enters the guide and inscribes a helical oil groove on its interior wall.

3,700,344

MORTISING DEVICE

Alfred T. Grumbach, 1427 Lincoln Boulevard, Santa Monica, Calif.

Filed Dec. 4, 1970, Ser. No. 95,313
Int. Cl. B27f *5/12*; B23b *45/14*
U.S. Cl. 408—108 6 Claims



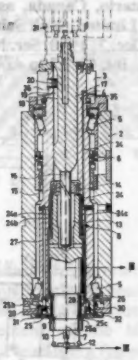
A device for forming an end mortise in a door-stile includes a frame positionable on the door-stile with a carriage vertically slidable along the frame. The carriage supports a drill holding means which is guided by the carriage for in and out movement so that a series of vertical holes may be precisely drilled into the end of the door-stile to define a mortise of vertical slot shape for receiving conventional door latch and locking mechanism.

3,700,345

ECCENTRIC BORING SPINDLE

Paul Schubert, Imtobel, Germany, assignor to Cross Europa-Werk GmbH, Wendligen, Postfach, Germany

Filed May 10, 1971, Ser. No. 141,490
Claims priority, application Germany, Nov. 4, 1970, P 20 54 165.5
Int. Cl. B23b *47/00*
U.S. Cl. 408—150 9 Claims



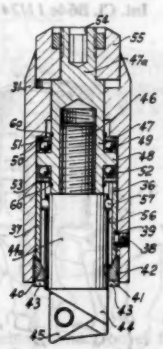
A driven spindle carries a boring bar which is rotatable on an eccentric axis to adjust the cutting edges. The boring bar is mounted in the spindle by at least one bushing having an elastically deformable bearing surface which can be forced against the boring bar by an incompressible pressure medium. With the pressure released, the boring bar may be rotatably adjusted. Raising the pressure will reduce or eliminate the radial play of the boring bar in the spindle.

3,700,346

BORING BAR INSERT

Otto Eckle, Lochgau, Germany, assignor to Firma Komet Stahlhalter-Und Werkzeugfabrik Robert Breuning GmbH, Besigheim/Neckar, Germany

Division of Ser. No. 806,572, March 12, 1969, Pat. No. 3,577,810. This application Feb. 1, 1971, Ser. No. 111,697
Claims priority, application Germany, March 20, 1968, P 17 52 014.8; March 20, 1968, P 17 52 012.6
Int. Cl. B23b *29/03*
U.S. Cl. 408—153 3 Claims



A boring bar insert having two counterwise movable boring tool carriers, the tools of which are arranged at oppositely actuated ends of the boring tool carriers when rotated through 180° to one another. For counterwise movement and adjustment of the boring tool carriers there is between their mutually facing shank ends an adjusting ring co-operating with

two counterwise screwthreads of the boring tool carriers and a centering device. The boring tool holders are securely held and also can be moved counterwise in the clamped condition. Centering of the boring tool carriers with respect to the boring bar axis is possible.

3,700,347

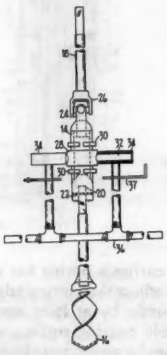
UNIVERSAL TAP JACK

Silvio Edward Nanne, and Renville O. Moody, both of Sault Sainte Marie, Ontario, Canada, assignors to The Algoma Steel Corporation Limited, Sault Sainte Marie, Canada

Filed Dec. 7, 1970, Ser. No. 95,862

Int. Cl. B23p *47/00*

U.S. Cl. 408—236 **1 Claim**



A drilling device comprises a tubular body portion having annular collar slidably mounted thereon so that the body can freely rotate within the collar and a drill rod is secured to one end of the body. A universal connection at the other end of the body is provided for attachment thereof to drill rotating means and a handle member is pivotally secured to the anular collar for manually directing the device.

3,700,348

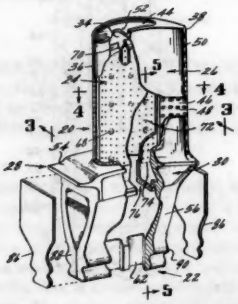
TURBOMACHINERY BLADE STRUCTURE

Robert J. Corsmeier, Cincinnati; Thomas G. Howell, West Chester; Charles E. Corrigan, and Bernard L. Koff, both of Cincinnati, all of Ohio, assignors to General Electric Company

Filed Aug. 13, 1968, Ser. No. 752,736

Int. Cl. B64c *11/24*

U.S. Cl. 416—90 **5 Claims**



An economically fabricated turbomachinery blade structure with good and predictable high temperature characteristics having a hollow integrally cast member defining the blade portion, the platform portion, a transition shank portion defining an opening to the blade chamber and a pair of juxtaposed rails extending therefrom. A hollow insert, formed with a plurality of nozzles in the side walls thereof, is secured within the cast member chamber so as to direct coolant fluid against the inner surfaces of the blade portion. To provide means enabling attachment of the blade to a supporting rotor, in one form, the juxtaposed rails are formed into abutting contact at their free ends and bonded. In another form, a root insert is provided which is secured to the inner surfaces of shank rails. Suitable passages are provided to direct coolant fluid into the insert chamber and to discharge the coolant fluid through the trailing edge and the end closure of the blade. Means may be provided to automatically space the insert nozzles from the blade side walls. A plurality of posts may be provided in the trailing edge portion of the blade to increase the effective convection cooling area. All bonds subjected to structural loading are spaced from the blade portion and positioned to be bathed in coolant fluid so as to reduce their operating temperature environment.

3,700,349

CONTROL SYSTEM FOR A BLADE-WHEEL PROPELLER

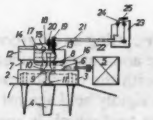
Werner Fork, Bremen-Artsen, Germany, assignor to J. M. Voith GmbH, Heidenheim, Germany

Filed June 14, 1971, Ser. No. 152,731

Claims priority, application Germany, June 18, 1970, P 20 29 996.1

Int. Cl. B63h *1/10*

U.S. Cl. 416—111 **9 Claims**



A blade-wheel propeller for a ship has pilot control means for operation of servo motors which displace a control column and are actuable from a remotely located control stand. A first pivotable servo shaft is operatively connected to the pilot control means and is connected to a rectilinear motion transmission means which includes a first pivot pin on a rectilinearly guided portion thereof. A second servo shaft is operatively connected to the pilot control means and is pivotally connected by a radius rod to the rectilinear motion transmission means. There are further provided means responsive to the position of the first pivot pin for operating the servo motors to position the control column to coincide with the pivot pin. A correction transmission in the form of a parallelogram joint is connected to the rectilinear motion transmission means and causes the central control disk to approach the neutral position along an approximately elliptical path.

3,700,350

HELICOPTER CYCLIC AND COLLECTIVE PITCH MECHANISM

Harold R. Scheibe, King George, and John E. Blankenship, Fredericksburg, both of Va., assignors to The United States of America as represented by the Secretary of the Navy

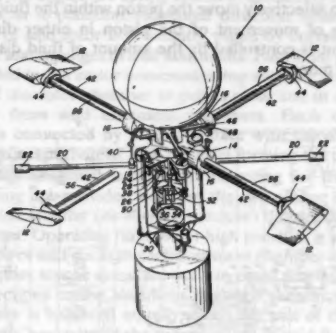
Filed Feb. 3, 1971, Ser. No. 112,161

Int. Cl. B64c *27/74*

U.S. Cl. 416—114 **5 Claims**

An apparatus for changing both the cyclic and collective pitch of each blade of a rigid rotor helicopter with a single differential gear mechanism. To change the collective pitch, a spider element is moved up or down which simultaneously actuates the differential gear mechanism for each blade in order to change its pitch collectively To change the cyclic pitch, a seesaw type linkage is actuated and applies a torque to the swash plate and control gyro of the helicopter. The control gyro supports lateral arms and the applied torque changes their plane of rotation. Linkages connected between each of

the control arms and differential gear mechanisms react to this change in the plane of rotation and actuate the appropriate



differential gear mechanisms to cyclically change the pitch of the blades.

3,700,351

TAIL ROTOR HUB ASSEMBLY FOR ROTARY WING AIRCRAFT

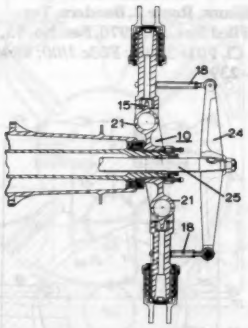
Peter John Flux, Somerset, England, assignor to Westland Aircraft Limited, Yoevil, Somerset, England

Filed Feb. 10, 1971, Ser. No. 114,299

Claims priority, application Great Britain, Feb. 27, 1970, 9,613/70

Int. Cl. B64c 27/08

U.S. Cl. 416—123 **5 Claims**



A tail rotor hub assembly for a rotary wing aircraft comprises a rotor hub having six radially extending arms arranged in three diametrically opposed pairs, each arm being adapted to support a tail rotor blade, the arms of each pair being staggered so that during operation the arms rotate in two separated planes, the staggered pairs being arranged so that alternate arms rotate one in each of the separated planes and groups of three arms rotate in each plane. The rotor hub and arms are of one piece construction, a common pitch change control mechanism is adapted for connection to all blades, and blade flapping control stops are integral with the rotor hub.

3,700,352

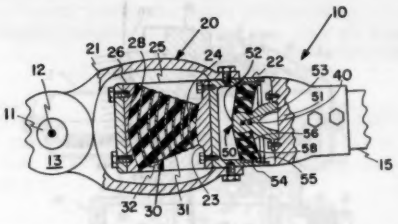
ROTOR SYSTEM

John H. Gorndt, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed March 5, 1971, Ser. No. 121,425

Int. Cl. B64c 27/38

U.S. Cl. 416—134 **11 Claims**



A rotor system for a rotary wing aircraft such as a helicopter or the like wherein a main resilient bearing restrains movement of the blade against centrifugal forces imposed thereon while permitting movement of the blade about certain designated axes such as a lead-lag, a flapping and a pitch axis. A secondary resilient bearing cooperates with the main resilient bearing for restraining bodily movement of the blade transverse to its longitudinal axis and preventing the introduction of undesirable stresses into either of the resilient bearings without interfering with movement or substantially increasing the resistance to movement of the blade about the designated axes while insuring that such latter movements are generally about a point and/or axis generally coincident with the center of both resilient bearings.

3,700,353

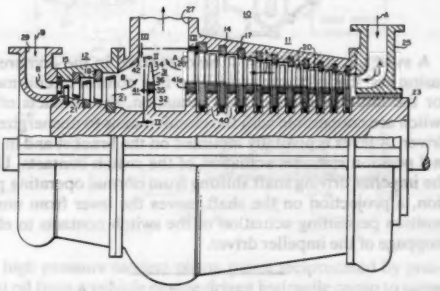
ROTOR STRUCTURE AND METHOD OF BROACHING THE SAME

Ralph J. Ortolano, Palos Verdes Peninsula, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 1, 1971, Ser. No. 111,530

Int. Cl. F01d 5/06

U.S. Cl. 416—199 **5 Claims**



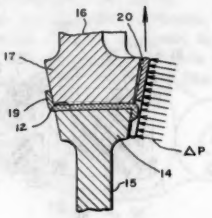
A method of broaching axial grooves for blade roots in a turbine rotor structure for a marine turbine having forward and astern elements exhausting to a common outlet and simultaneously broaching axial grooves for an integral exhaust baffle structure.

The resulting structure is a rotor having a plurality of axial rows of grooves comprising an equal number of grooves in the rotor portion and the baffle structure.

3,700,354
COMPRESSOR BLADE ROOT SEAL

James P. Memery, Manchester, Conn., assignor to The United States of America as represented by the Secretary of the Navy

Filed May 3, 1971, Ser. No. 139,642
Int. Cl. F01d 5/32
U.S. Cl. 416—219 6 Claims

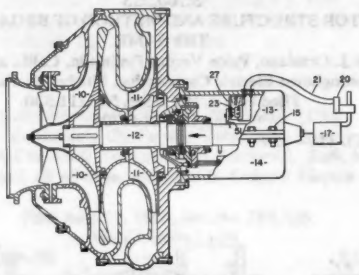


A sealing device for restricting leakage across the stages of an axial compressor through the clearances around the root fittings of replaceable blades. A compliant dished annulus is attached on the high pressure side of each compressor stage at its inside radius. The combination of centrifugal force and pressure differential across each compressor stage deforms the sealing device against the blade root fittings thereby restricting the leakage.

3,700,355
EMERGENCY SHUTDOWN MECHANISM FOR CENTRIFUGAL COMPRESSOR

Carl M. Anderson, and James W. Endress, both of Syracuse, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed July 8, 1971, Ser. No. 160,691
Int. Cl. F04b 49/02
U.S. Cl. 417—33 4 Claims



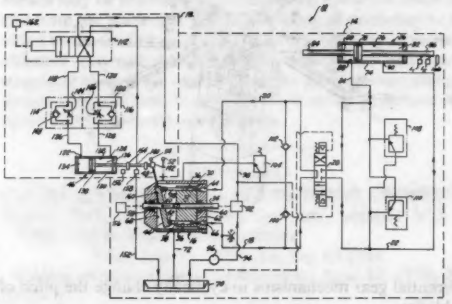
A switch is mounted on a bracket fixed in the compressor casing and has contacts connected in a control circuit means for the impeller driver. Upon actuation, the contacts of the switch are cooperable with the circuit means to deenergize the driver. A lever is pivotally mounted on the bracket and in normal position restrains actuation of the switch contacts. Upon the impeller driving shaft shifting from normal operating position, a projection on the shaft moves the lever from normal position permitting actuation of the switch contacts to effect stoppage of the impeller driver.

3,700,356
FLUID SYSTEM

Philip A. Kubik, 6809 Spruce Drive, Birmingham, Mich.

Continuation-in-part of Ser. No. 50,093, June 26, 1970, Pat. No. 3,653,208. This application Aug. 26, 1970, Ser. No. 67,177
Int. Cl. F04b 1/26
U.S. Cl. 417—222 17 Claims

A fluid system having a variable displacement fluid pump connected in a closed loop circuit to a fluid cylinder having a piston and a pair of connecting rods extending from opposite sides of the piston externally of the fluid cylinder. A directional control valve disposed in the closed circuit between the inlet and outlet of the fluid pump is adapted to selectively direct fluid to one side of the piston within the fluid cylinder, while exhausting fluid from the other side of the piston, to selectively move the piston within the fluid cylinder. The rate of movement of the piston in either direction of movement is controlled by the amount of fluid displaced by the fluid pump.

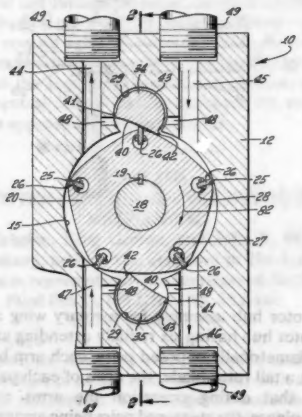


A second directional control valve is adapted to direct fluid from a second source of fluid to a pressure responsive displacement control mechanism to selectively vary the displacement of the fluid pump between a maximum and a minimum flow position. The rate of fluid flow to the pressure responsive displacement control mechanism is selectively varied to control the rate of displacement of the fluid pump and to thereby selectively control the rate of movement of the cylinder piston, while the maximum flow position may be varied between defined limits by an electrically operated remote control.

3,700,357
ROTARY ENGINE

Robert H. Williams, Route 2, Bandera, Tex.

Filed Nov. 27, 1970, Ser. No. 93,171
Int. Cl. F01c 21/00; F03c 3/00; F04c 15/00
U.S. Cl. 418—239 3 Claims



A stator having a main cylindrical chamber with concentric end bearings in which journal the shaft of a pentagonal parallel pistoned rotor, seal vanes on the piston crests sweeping the walls of said chamber and dividing the peripheral vacant space between said walls and said rotor into a series of five circumferentially contiguous sealed off expansion chambers. A pair

of diametrically opposed cylindrical abutment chambers are provided in the stator which are parallel with and intersect the rotor chamber and have end bearings concentric therewith in which trunnions journal, to rotatably mount abutments in said chambers. The trunnions extending from said abutments to the rear of the engine are spring biased to constantly rock said abutments in a common rotational direction whereby the periphery of said rotor is constantly wiped by corresponding transverse sealing edges of said abutments. Four fluid passages are provided in the stator communicating with the peripheral portion of the rotor chamber at points close and in opposite directions from said abutment chambers. Each of these passages is connected by a smaller duct with the abutment chamber adjacent thereto. The material forming the enclosed face of each abutment is removed excepting for transverse radial sealing lips provided adjacent the two sealing edges of an approximately flat (or slightly concave) diametral face of the abutment. Operating fluid under high pressure is admitted through one of said ducts to each abutment chamber and pressurably applies torque simultaneously in equal amounts in opposite directions to the abutment mounted therein whereby said pressure is balanced equally about the axis of the abutment thereby neutralizing the torque effect of said fluid pressure on said abutment.

Manual control means, including a four-way fluid reversing valve, and a biasing spring reversing mechanism functions to set the engine to run in either direction when fluid under high pressure is supplied to said valve.

3,700,358

FAN ASSEMBLY FOR A VENTILATOR

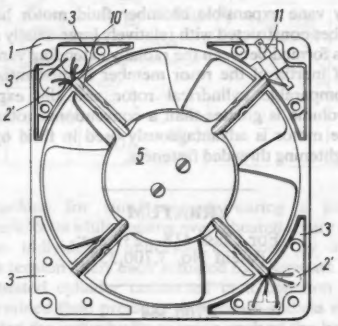
Georg F. Papst; Emil Gierschek, and Hans-Dieter Papst, all of St. Georgen, Germany, assignors to Papst-Motoren KG, St. Georgen, Germany

Filed Dec. 23, 1970, Ser. No. 101,026

Claims priority, application Germany, Dec. 24, 1969, P 19 64 890.9

Int. Cl. F04b *17/00, 35/04;* **H02k** *7/00, 68/73*

U.S. Cl. 417—354 **3 Claims**



A fan assembly for a ventilator, and a square ventilator housing comprising a first portion formed with a first passage of circular cross-section and wherein the fan assembly is at least partially received, and at least one second portion rigid with the first portion and formed with a second passage axially aligned and directly communicating with said first passage, said second passage having an open end spaced from the first passage and having throughout its length and at the open end thereof a cross-sectional area greater than the cross-sectional area of the circular first passage and a transverse dimension greater than the diameter of the circular first passage. The electronic components as resistors, condensors, transistors, diodes and the like which are necessary for commutation and/or for electrical control of this fan assembly are placed inside one or more hollow portions in the corners of said square housing.

3,700,359

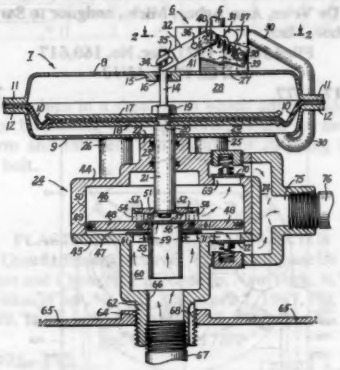
EXPLOSION-PROOF LIQUID FUEL PUMP

John A. Vanderjagt, Memphis, Tenn., assignor to Science, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 23,866, March 30, 1970, abandoned. This application May 18, 1971, Ser. No. 144,548

Int. Cl. F04b *17/00, 23/04;* **F01l** *31/12*

U.S. Cl. 417—404 **14 Claims**



A double acting piston type liquid fuel pump is driven by an integrally constructed coaxial flexible-diaphragm gas piston within a dual compartment chamber. The compartments are alternately connected to a vacuum or pressure source through a reversible toggle valve operated by movements of the diaphragm.

3,700,360

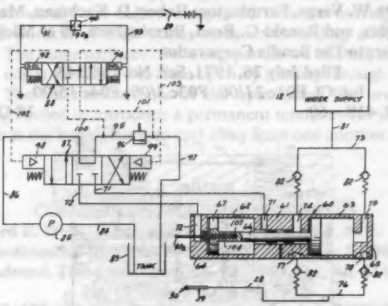
DOUBLE-ACTING TANDEM PISTON PUMP

Roland E. Shaddock, Streator, Ill., assignor to Myers-Sherman Company, Streator, Ill.

Division of Ser. No. 857,424, Sept. 12, 1969, Pat. No. 3,658,589. This application Aug. 23, 1971, Ser. No. 173,767

Int. Cl. F04b *9/08, 17/00, 35/00;* **F01l** *25/08*

U.S. Cl. 417—404 **7 Claims**



A high pressure tandem piston pump reciprocated by pressured oil from a vehicle engine driven hydraulic pump to surge water at high pressure from a vehicle tank or other source through a hose and nozzle to create a jumping action or jack hammer driving of the nozzle forcing it through and around obstructions in a sewer pipe. The engine driven pump pumps oil to opposite sides of one of the pistons of the tandem pump causing it to reciprocate the piston for high pressure surging delivery of water. Oil flow to opposite sides of the driving piston to is controlled from a valve tripped by a switch which is actuated by a control rod slidable in a recess of the connecting rod between the two pistons of the tandem pump and ar-

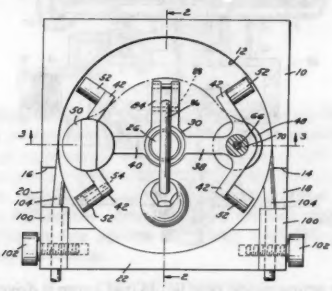
ranged to be pushed to a switch tripping position at one end of the stroke of the pump admitting high pressure oil which further ejects the control rod and holds it in an extended position until pulled to a retracted locked position at the opposite end of the stroke of the pump permitting the switch to again be tripped for reversing the flow from the engine driven pump.

3,700,361

PERISTALTIC PUMP CONSTRUCTION

James H. De Vries, Ann Arbor, Mich., assignor to Sarns, Inc., Ann Arbor, Mich.

Filed July 8, 1971, Ser. No. 160,617
Int. Cl. F04b *43/12*
U.S. Cl. 417—477 **7 Claims**



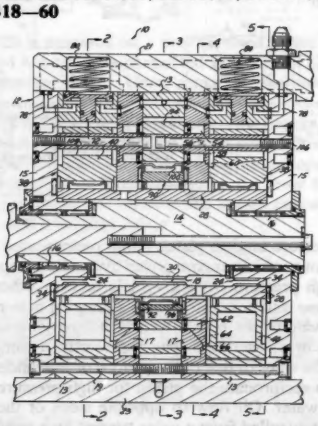
A rotor for a peristaltic pump assembly which is formed of a unitary element having radial arms recessed at the distal ends to receive pressure rollers for the pump and wing formations at the distal ends for carrying guide rollers extending radially of the axis of the rotor and spaced axially on either side of the rollers to serve as a tube guide. The assembly includes a mount on the rotor for a drive crank which can be utilized in one position as a manual crank for the rotor and which can be stored within the rotor in a second position in which it also serves as a connection drive between a power shaft and the rotor. Movement of the crank to the manual position disconnects the rotor from the power drive.

3,700,362

RING GEAR DRIVE WITH INTERNAL ROTARY CLUTCH

Kenneth W. Verge, Farmington; Robert D. Kachman, Madison Heights, and Ronald G. Read, Birmingham, all of Mich., assignors to The Bendix Corporation

Filed July 26, 1971, Ser. No. 166,145
Int. Cl. F01c *21/00*; F03c *3/00*; F04c *15/00*
U.S. Cl. 418—60 **18 Claims**



An actuator of the type utilizing an orbiting ring gear to drive an output shaft in which a rotatable clutch is provided for coupling and decoupling the ring gear to the output shaft. A bearing supported crank ring cooperates with a supporting clutch ring to hold the ring gear in a confined path when coupling of the ring gear to the output shaft is desired, and the clutch ring is rotatable to a position in which the ring gear can be moved out of driving engagement with the output shaft when decoupling is desired. Fluid actuated motors, arranged symmetrically with respect to the clutch ring, are operable to move the ring gear so as to drive the output shaft and centering pistons cooperate with the motors to decouple the ring gear from the output shaft when the clutch ring is in a position releasing the ring gear for movement out of engagement with the output shaft.

3,700,363

LOW INERTIA MOTOR FOR FLUID OPERATED TOOL

Clarence A. Sorensen, Fruitport, and Edwin J. Deremo, Spring Lake, both of Mich., assignors to Gardner-Denver Company, Quincy, Ill.

Continuation of Ser. No. 818,957, April 24, 1969, abandoned. This application Feb. 4, 1971, Ser. No. 112,773
Int. Cl. F01c *13/02*
U.S. Cl. 418—270 **2 Claims**

A rotary vane expansible chamber fluid motor having a rotor member constructed with relatively large axially extending grooves formed between the radially extending vanes. The moment of inertia of the rotor member is substantially less than a comparable cylindrical rotor and the expansible chamber volume is greater than a conventional rotary vane motor. The motor is advantageously used in fluid operated tools for tightening threaded fasteners.

ERRATUM

For Class 418—239 see:
Patent No. 3,700,357

3,700,364

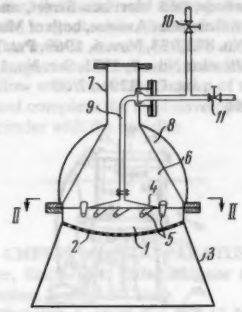
APPARATUS FOR GRANULATING MELTS

Alexei Alexeevich Vagin, Dzerzhinsk; Stanislav Valerievich Yablonsky, Kazan; Pete Stepanovich Voloshin, Dzerzhinsk; Nikolai Gregorievich Sharov, Dzerzhinsk; Viktor Ivanovich Shiborin, Dzerzhinsk; Vladimir Efimovich Novakowsky, Dzerzhinsk; Grigory Vasilievich Kolpakov, Dzerzhinsk; Mark Efremovich Ivanov, Moscow; Viktor Mikhailovich Lindin, Moscow, and Daniil Yakovlevich Lipsky, Moscow, all of U.S.S.R., assignors to Dzerzhinsky Filial Nauchno-Issledovatelskogo i Konstruktorskogo Instituta Khimicheskogo Mashinostroenia, Dzerzhinsk, U.S.S.R.

Filed Dec. 23, 1969, Ser. No. 887,640
Claims priority, application U.S.S.R., Dec. 23, 1968, 1291391
Int. Cl. B22d *23/08*; B29c *23/00*
U.S. Cl. 425—7 **5 Claims**

An apparatus for granulating melts comprising a chamber with a perforated bottom provided with branch pipes for sup-

plying the melt into this chamber, in which the outlet tips of the branch pipes are directed relative to the perforated bottom so as to provide a continuous rotary motion of the melt above the inner surface of the bottom.

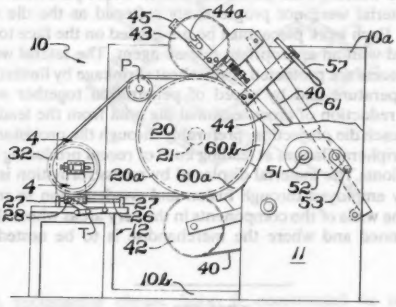


3,700,365

APPARATUS FOR CONTINUOUSLY VULCANIZING ENDLESS BELTS

Alvin W. Spicer, Cuyahoga Falls, and Anselm Talalay, Cleveland, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Sept. 21, 1970, Ser. No. 73,731
Int. Cl. B29h *7/22*
U.S. Cl. 425—28 **21 Claims**



A machine for simultaneously curing a plurality of elastomeric belts while passing over a heated rotary drum. The belts are individually uniformly tensioned by individually movable tension idlers each actuated by a separate fluid pressure actuated cylinder connected to a common source of predetermined fluid pressure. A separate endless metal band is provided for individually pressing each of the belts against the drum with the bands each passing over an individual movable tension idler similar to that used for the belts for maintaining each of the bands at a predetermined uniform tension.

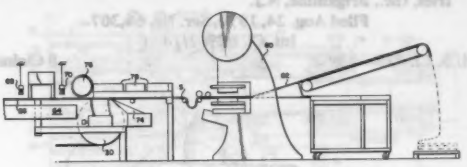
3,700,366

APPARATUS FOR PRODUCING RESINOUS SHEETLIKE PRODUCTS

Anthony N. Piacente, Lawrenceville, N.J., assignor to Congoleum Industries, Inc., Kearny, N.J.

Filed May 25, 1970, Ser. No. 40,269
Int. Cl. B29j *5/00*
U.S. Cl. 425—71 **14 Claims**

An apparatus for continuously molding a resinous sheet-like product including an endless polished smooth surface belt, feed means for metering resinous chips onto the belt in substantially abutting contact and in a substantially mono-chip layer, means for heating the metered chips and the belt, means for compressing the heated chips against the belt to consolidate the chips in a sheet form which adheres to the belt, means for burnishing the sheet form, means for cooling the sheet form and the belt, and means for stripping the sheet from the belt.

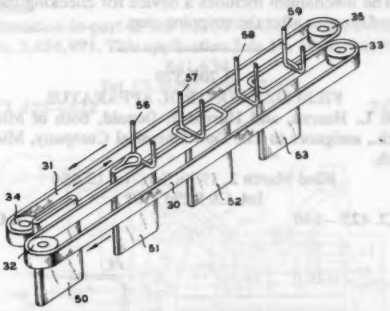


3,700,367

PLASTIC BAG FLARING APPARATUS

John J. Quackenbush, Monroe, Conn., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 629,328, April 7, 1967, Pat. No. 3,629,389. This application March 17, 1971, Ser. No. 125,379
Int. Cl. B29c *17/02*
U.S. Cl. 425—112 **1 Claim**



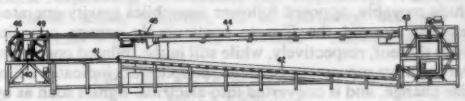
In order to cause the opposing panel ends of a plastic bag to curl outwardly, the bags are captured between moving belts with a portion of their upper surfaces extending above the belts. The outer surfaces of the bag panels are heated, and the panel edges are forced to flare open by passing through a stiff wire. The interior surfaces of the open panel lips are then rapidly cooled to introduce a permanent tendency for the bag panels at the bag opening to curl away from one another.

3,700,368

CONTINUOUS MOLDING APPARATUS

Howard E. Wells, 218 Shadmore Drive, Rochester, N.Y.

Continuation-in-part of Ser. No. 460,404, June 1, 1965, abandoned. This application Jan. 22, 1969, Ser. No. 814,868
Int. Cl. B29c *3/02*; **B29g** *7/02*
U.S. Cl. 425—115 **20 Claims**



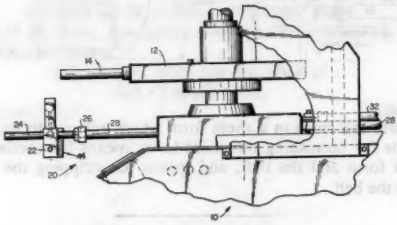
A continuous foamed strip molding method and apparatus uses two continuous lengths of mold halves that snap-fit together to hold the foamed strip and are flexible enough to be driven in a curved path with one mole half inside the other for high speed and adequate cure time in relatively small space.

3,700,369

STRIPPER FOR BLOW MOLDING MACHINE

Joseph A. Johnson, Brigantine, N.J., assignor to Jomar Industries, Inc., Brigantine, N.J.

Filed Aug. 24, 1970, Ser. No. 66,307
Int. Cl. B29f 1/14
U.S. Cl. 425—139 **8 Claims**



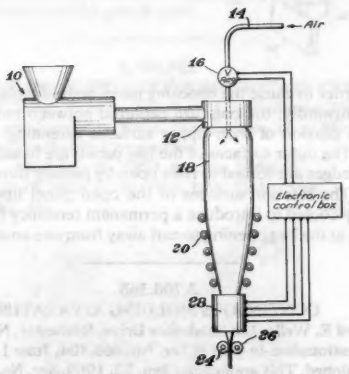
A stripper mechanism for an automatic blow molding apparatus having a rotatable turret carrying plural sets of parison pins for forming molded articles. A set of stripper fingers project between the formed article carrying pins at an ejection station and are reciprocated parallel to the pins to strip formed articles therefrom. The span of stroke of the stripper fingers is adjustable and the fingers can be lowered to provide operation of the apparatus without an automatic stripping step. The mechanism includes a device for checking the condition of the pins after the stripping step.

3,700,370

FILM SIZE CONTROL APPARATUS

Harold L. Hearns, and Harold J. Donald, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed March 2, 1970, Ser. No. 15,454
Int. Cl. B29d 7/02
U.S. Cl. 425—140 **4 Claims**



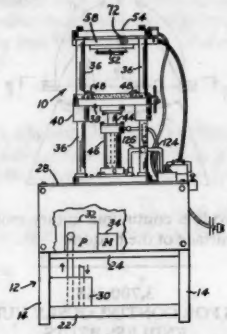
Apparatus and method for automatically injecting and/or withdrawing air from tubularly extruded film when needed, to obtain precise size control of the film. Such apparatus can include movable, opposed follower assemblies gravity operated inwardly toward the film to continuously engage opposite sides thereof, respectively, while still in the inflated condition. Any relative movement between the followers indicates a film size change, and is converted into electrical signals such as by potentiometer means or the like. Such signals energize electronic circuitry which, in turn, operates electrical valving means for inserting or withdrawing air from the film at the proper moment. The apparatus is not affected by film edge wrinkle or lateral sway of the film during measurement and, in addition, does not require drive motors or the like to operate.

3,700,371

MACHINE FOR MAKING PACKAGING COMPONENTS OF FOAM MATERIAL

Clarence K. Edwards, 865 Morrison Street, and Lawrence D. Edwards, 2816 Rosemont Avenue, both of Medford, Oreg.

Division of Ser. No. 873,953, Nov. 6, 1969, Pat. No. 3,670,064.
This application Nov. 1, 1971, Ser. No. 194,146
Int. Cl. B29c 17/00
U.S. Cl. 425—144 **10 Claims**



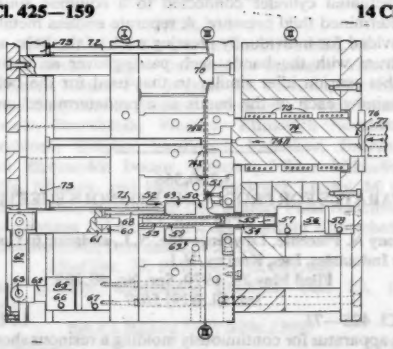
The invention relates to a novel molding press for making improved packaging components of firm sheets or blocks thermoplastic foam. Recesses of predetermined size, shape and depth are pressed into sheets of the foam material by the combined effect of a die or hob structure maintained at a temperature which will not melt, but will substantially soften the material, such structure being forced into the material by a pressure which would be inadequate to effect penetration if the material were not progressively softened as the die advances. Each work piece must be pre-coated on the face to be recessed with an appropriate release agent. The lateral walls of the recess are protected against heat shrinkage by limitation of temperature and by speed of penetration together with abrupt reduction of cross-sectional die area from the leading end of each die projection, preferably through the provision of thin peripheral flanges at leading ends of recess producing die projections. The material displaced by recess formation is all usefully employed through fusion and condensation to reinforce the walls of the components in the very areas where they are thinned and where the merchandise is to be nested in them.

3,700,372

PUMP IMPELLER MOLDING APPARATUS

Donald P. Lalley, Elgin, Ill., assignor to March Manufacturing Company, Glenview, Ill.

Filed Dec. 23, 1969, Ser. No. 887,494
Int. Cl. B29f 1/06
U.S. Cl. 425—159 **14 Claims**



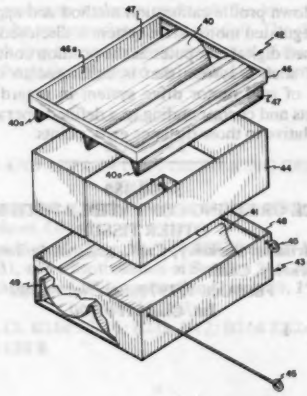
Apparatus for molding a plastic pump impeller having an annular coupling magnet totally enclosed and sealed within a

hub formation traversed by a shaft bore. The plastic melt is injected into a special mold having movable core and magnet-supporting parts and means for actuating the same in a time sequence such that the melt forms the impeller configurations at one end of the magnet while the shaft bore is temporarily blocked off. The melt is caused to flow about the external aspects of the magnet toward the distal end thereof and then to resume the flow with timed opening up of the shaft bore to line the latter and complete the total envelopment of the magnet in unitary joinder with the impeller.

3,700,373
CHEESE MOLD APPARATUS

Dean A. Fowler, Smithfield, Utah, assignor to Cache Valley Dairy Association, Smithfield, Utah

Filed June 1, 1970, Ser. No. 42,343
Int. Cl. A01j *25/15*
U.S. Cl. 425—195 **4 Claims**



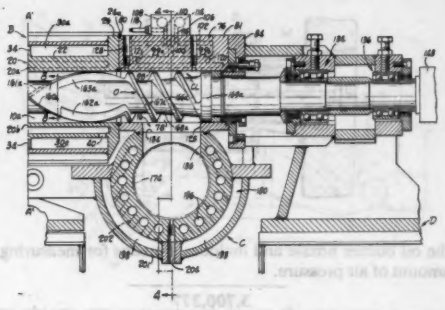
A rectangular cheese hoop is constructed to conform generally in outside dimensions, assembly and operation to a conventional block cheese hoop. If desired, a block cheese hoop may be modified by the insertion of novel adapters. The adapters (or equivalent horn hoop structures) are in the form of platen members, each of which carries at least one, preferably two, concave molds shaped as longitudinal sections of a cylinder. The horn cheese hoop is loaded with curd and pressed in the fashion conventional with block cheese hoops. Thus, pressing is in a direction normal the axis of the fully pressed horn.

3,700,374
CONTINUOUS MIXER WITH SCREW DISCHARGE CONTROL

James T. Matsuoka, Brecksville, and Armindo Cantarutti, Akron, both of Ohio, assignors to Intercole Automation, Inc., Cleveland, Ohio

Filed July 14, 1969, Ser. No. 841,349
Int. Cl. B29f *3/02*
U.S. Cl. 425—208 **18 Claims**

An internal mixer with parallel mixing rotors and a screw controlled discharge. The material discharge rate is controlled by operation of a screw in a conduit from the mixing chamber through which mixed material is discharged. Preferably, the

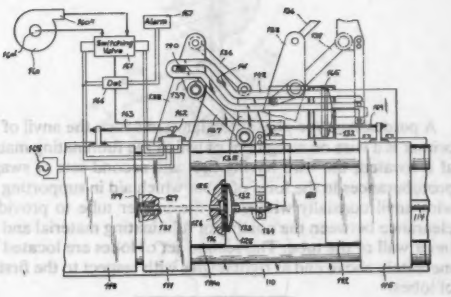


screw is a part of a screw-type extruder and further conditions and extrudes the material.

3,700,375
INJECTION-MOLDING MACHINE WITH ALARM DEVICE

Herbert Rees, Toronto, Ontario, Canada, assignor to Husky Manufacturing and Tool Works Ltd., Bolton, Ontario, Canada

Continuation-in-part of Ser. No. 597,641, Nov. 29, 1966, Pat. No. 3,454,991. This application July 14, 1969, Ser. No. 841,634
Int. Cl. B29c *7/00, 17/07*
U.S. Cl. 425—422 **2 Claims**



A take-off member, interposable between a movable mold portion and its mate to receive the molded articles for removing them from the mold, has a seat for a molded article adjacent a chamber connected to a source of vacuum (or fluid pressure) by way of a pressure sensor which detects the lack of buildup of a pressure differential, caused by the absence of a molded article from the seat, to give an alarm signal.

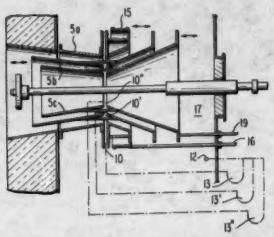
3,700,376
OIL BURNER

Horst Niepenberg, Oberhausen; Rolf Oppenberg, Wesel, and Rudolf Kuhn, Mulheim, all of Germany, assignors to Deutsche Babcock & Wilcox Aktiengesellschaft, Oberhausen, Germany

Filed Dec. 28, 1970, Ser. No. 101,731
Int. Cl. F23d *5/12*
U.S. Cl. 431—13 **7 Claims**

An oil burner for connection to the wall of a boiler or steam generator having an axially movable burner pipe which extends through an opening in the rear wall of the burner, and an air measurement device in the form of a venturi meter surrounding the burner pipe and including a first truncated cone

of a venturi meter which is coupled to the air chamber for regulating the air supply. A second truncated cone surrounds

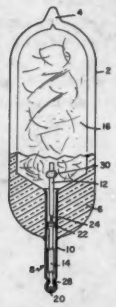


the oil burner nozzle and includes a means for measuring the amount of air pressure.

3,700,377
PHOTOFLASH LAMP

Stephen V. Brown, Williamsport, Pa., assignor to Sylvania Electric Products Inc.

Filed Nov. 27, 1970, Ser. No. 93,109
Int. Cl. F21k *5/02*
U.S. Cl. 431—93 **2 Claims**

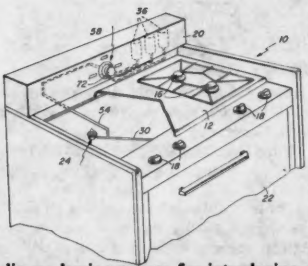


A percussive-type photoflash lamp in which the anvil of the primer is a wire on a segment of which the fulminating material is located, the wire having first and second sets of swaged protuberances in the form of lobes which aid in supporting the wire anvil coaxially within the the primer tube to provide a clearance between the coating of fulminating material and the inner wall of the tube. The second set of lobes are located immediately above and at right angles with respect to the first set of lobes.

3,700,378
ODOR CONTROL APPLIANCE

William J. Scheid, Allentown, Pa., assignor to Ratheon Company

Filed Oct. 28, 1970, Ser. No. 84,693
Int. Cl. F23j *7/00*
U.S. Cl. 431—253 **18 Claims**

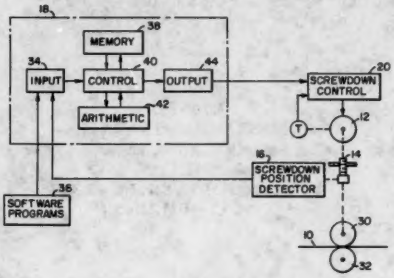


A gas appliance having means for introducing a selected fluid to the pilot or burner flame for dissipation into the air as an odorizer, air freshener or fumigant.

3,700,379
MOTOR DRIVE POSITION MOVEMENT PROFILE CALIBRATION

James D. Robertson, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 14, 1971, Ser. No. 152,787
Int. Cl. B21b *37/12*; G06f *9/00*; H02p *3/00*
U.S. Cl. 444—1 **25 Claims**

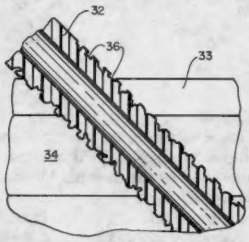


A slowdown profile calibration method and apparatus for a position regulated motor drive system is disclosed, including a programmed digital computer as the position controlling component of such a system that is calibrated to optimize the operation of said motor drive system in regard to distance error points and corresponding to a defined operational speed pattern relative to those distance error points.

3,700,380
SURFACE OR LINING COMPATIBLE WITH BLOOD OR OTHER TISSUE

Sotiris Kitrilakis, Berkeley, Calif., assignor to Tecna Corporation, Berkeley, Calif.

Filed Oct. 1, 1970, Ser. No. 77,289
Int. Cl. A61f *01/00*
U.S. Cl. 3—1 **7 Claims**



A surface or lining containing microcavities for anchoring pseudointimal growth within blood handling prostheses such as vascular grafts, heart assist pumps, artificial hearts, extracorporeal devices, and the like to form a thin, stable autologous lining. The surface is also compatible with other living tissue and promotes tissue adhesion to percutaneous leads, catheters, cannulae, etc., which inhibits bacterial penetration and consequent infection. A method of forming a lining or surface containing microcavities.

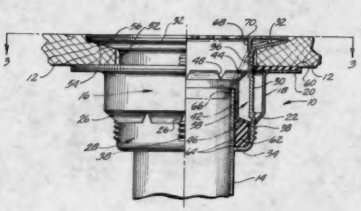
3,700,381
COUPLING ASSEMBLY

Heinrich E. Deeke, Los Angeles, Calif., assignor to National Tool & Die Corporation, Huntington Park, Calif.

Filed Dec. 21, 1970, Ser. No. 100,013
Int. Cl. E03c *1/20, 1/26*
U.S. Cl. 4—288 **12 Claims**

A coupling assembly includes a sleeve having an upper portion mounted in an opening in a floor or tank and a lower por-

tion below the opening disposed around the outer surface of a conduit. An outer lock ring clamps the lower portion of the sleeve in a rigid position in the opening. The inner surface of the sleeve's lower portion is spaced laterally from the outer surface of the conduit to form an annular space between the sleeve and conduit for receiving a deformable gasket. Vertically spaced apart serrations are formed on the inner surface



of the sleeve's lower portion, and an inner lock ring having an outwardly projecting shoulder is driven down into the annular space so it presses against the upper surface of the gasket to squeeze the gasket so it clamps and seals the lower portion of the sleeve to the outer surface of the conduit. The shoulder on the inner lock ring is engaged between a pair of the serrations to maintain the gasket clamped and sealed between the sleeve and conduit.

3,700,382

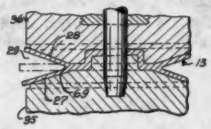
METHOD AND APPARATUS FOR MAKING GROOVED WHEELS

Matthew Pacak, Solon, Ohio, assignor to Eaton Yale & Towne Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 854,957, Nov. 23, 1959, Pat. No. 3,087,531, and a continuation of Ser. No. 266,451, March 19, 1963, abandoned. This application March 30, 1966, Ser. No. 538,853

Int. Cl. B21d *53/26*; B21k *1/42*; B21d *22/14*

U.S. Cl. 29—159 R **26 Claims**



This invention relates to the manufacture of peripherally grooved members, such as peripherally grooved wheels, pulleys, sheaves and other wheel-like members, and provides a novel method and novel apparatus for producing such grooved members by a blank-splitting procedure. The grooved members are hereinafter referred to merely as grooved wheels.

3,700,383

SCRAPER ELEVATOR LIFTING AND CUSHIONING MECHANISM

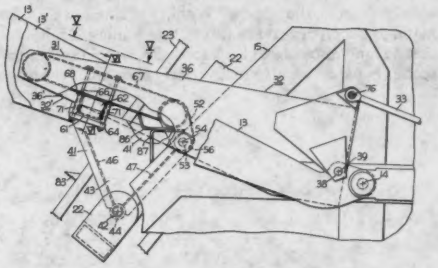
Richard F. Boersma, Springfield, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 15, 1971, Ser. No. 180,692

Int. Cl. B60p *1/36*

U.S. Cl. 37—8 **10 Claims**

The elevator of an elevating type scraper is supported at the open front end of the bowl by linkage permitting upward and rearward swinging movement to a raised position in which it is sufficiently high to permit the ejector to move forward in the bowl during the unloading operation. The linkage for raising and lowering the elevator includes cushioning means operative to cushion the elevator against shock when rocks or other



large objects are encountered during the excavating operation.

3,700,384

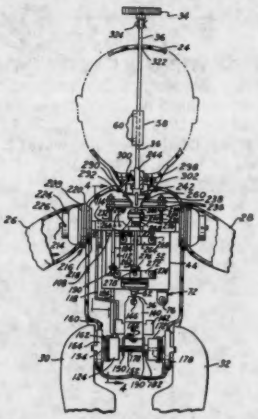
BALLERINA DOLL

Robert Gardel, New York, N.Y., and Egon Gorsky, Westfield, N.J., assignors to Mattel, Inc., Hawthorne, Calif.

Filed March 25, 1971, Ser. No. 127,910

Int. Cl. A63h *13/02*

U.S. Cl. 46—136 **11 Claims**



A hand-operated doll having animated leg, arm and head movement. The movements of the doll simulate those of a ballet dancer. The leg and arm movement is synchronized to have a leg raised while the arms are moving downward toward the leg and to have the arms raised as the leg moves downward to a vertical position. The doll is rotated on the toe of the other leg. A head spotting mechanism is provided for controlling the rotation of the head as a function of the rotation of the torso.

3,700,385

PANEL AND STILE CONSTRUCTION

John C. Sherwood, La Crescenta, Calif., assignor to Sher Walls Inc., Santa Fe Springs, Calif.

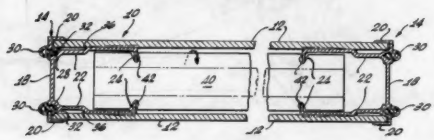
Filed Nov. 2, 1970, Ser. No. 86,219

Int. Cl. A47b *5/00*; A04g *3/03*

U.S. Cl. 52—36 **5 Claims**

An extruded stile is shaped as a shallow channel within which is a relatively deep channel. The narrow outer walls are rigid and at right angles to the web, and the wider inner walls normally flare outwardly and exhibit spring action when forced inwardly to parallel relation. The outer portions of the inner walls are outwardly offset from their inner portions, and

their edges terminate in inwardly turned lips. The edges of decorative face sheets of hollow core panels are captured between the outer and inner walls, with the offset portions of the inner walls forced to parallel relation and thereby outwardly biasing the sheets. Within its inner walls, the stile matingly receives a rod or tubing that is integral with stands or casters, and also splines for supporting panels end to end. The space between confronting outer and inner walls is also



adapted to nestably receive an extrusion with a slotted wall to support shelving. Interlocking the stile and face sheets is effected by bonding the offset portions of the inner walls to the face sheets, by locking elongated bars at their ends to the lips of the inner edges of opposite sides of the panel, or by nailing or screwing the web to an interior frame or block. On its outer surface the web is provided with parallel grooves to receive seal strips, and the web forms a support surface for a decorative face strip.

3,700,386

APPARATUS FOR CANNING FISH

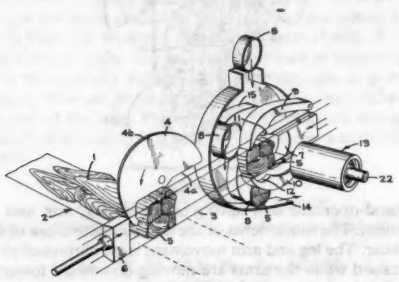
Samuel A. Mencacci, Saratoga, Calif., assignor to International Machinery Corporation S.A., St. Nicklaas-Waas, Belgium

Filed Nov. 10, 1970, Ser. No. 88,429

Claims priority, application Belgium, Nov. 12, 1969, 49677

Int. Cl. B65d *63/02*

U.S. Cl. 53—123 **7 Claims**



A fish can filling apparatus including a conveyor for advancing fish fillets past a rotary cutter which cuts the fish into segments and then advances the segments into a compression chamber. A piston then transfers the segments of fish against a forming surface corresponding in shape to a portion of the side wall of the can to be filled. Shaping knives are then closed to form part of the remainder of the fish segments into a shape corresponding to the shape of the remaining portion of the side walls of the can. A reciprocating piston then transfers the formed charge of fish into the open can, and when approaching the end of its transfer stroke and at the beginning of its return stroke, the piston is oscillated about its axis to minimize the tendency of the fish to stick to the piston and also to prevent flakes or chips of the fish from being pulled off the surface of the charge of fish.

3,700,387

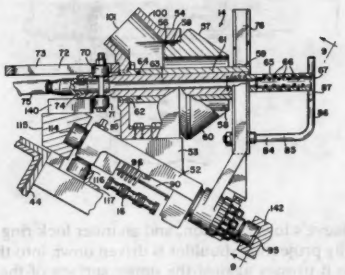
VACUUM BAGGING MACHINE

Lowell B. Moore, Moline, Ill.; Raymond J. Keating, Bettendorf, Iowa, and Warren Underwood, Minneapolis, Minn., assignors to The Kartridg Pak Co., Davenport, Iowa

Filed April 26, 1971, Ser. No. 137,412

Int. Cl. B65 *31/06*

U.S. Cl. 53—77 **32 Claims**



A semi-automatic machine adapted to vacuumize and close bags of flexible material for packaging products such as, for example, cuts of fresh meat, which may vary in size and shape, the machine including an intermittently advancing belt conveyor on which successive filled bags are supported and a series of vacuum heads mounted on a chain conveyor for travel in a parallel path along one side of the belt conveyor, which heads carry vacuum nozzles each with associated means for gathering and clamping the mouth of a bag on the nozzle after which it is vacuumized and advanced to a mechanism for applying to the gathered portion of the bag mouth a metal clip upon the vacuum nozzle being withdrawn therefrom.

3,700,388

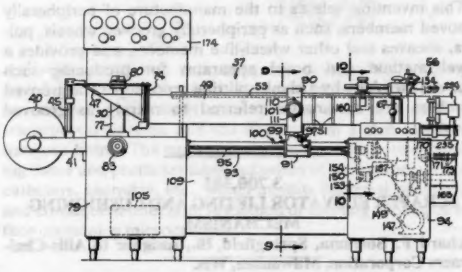
PACKAGING MACHINE FOR FORMING AND FILLING BAGS OF DIFFERENT LENGTHS AND WIDTHS

Kenneth Johnson, and Robert F. Lense, both of Rockford, Ill., assignors to Rexham Corporation, New York, N.Y.

Division of Ser. No. 706,817, Feb. 20, 1968, Pat. No. 3,553,934, which is a continuation-in-part of Ser. No. 689,177, Dec. 8, 1967, Pat. No. 3,545,166. This application Sept. 30, 1970, Ser. No. 76,946

Int. Cl. B65b *9/08*

U.S. Cl. 53—183 **7 Claims**



Bags which may vary in length and width within preselected ranges from one run to another are formed from a web of flexible material and are filled with a quantity of product as they are advanced in vertical planes along a horizontal path by a packaging machine. To reduce the number of adjustments necessary for changing over the machine from running bags of

one length and width to running bags of a different length and width, the machine is capable of being set up to maintain the upper ends of both long and short bags moving along a common operating or datum line during the advance of the bags and, at the same time, to maintain the longitudinal center lines of both wide and narrow bags in exact coincidence with the working centers of various mechanisms spaced along the path for operating on the bags before, during and after filling.

The disclosure also specifically pertains to a number of new and improved mechanisms for forming and handling the bags and to the drive mechanism of the machine.

3,700,389

SPRAYING BOOTH

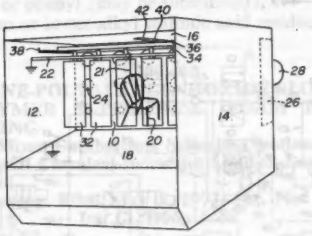
Maurice Paul Wanner, Geneva, Switzerland, and Neil Rudolph Wallis, Goring on Thames, England, assignors to Aerocoat S.A., Geneva, Switzerland

Filed May 26, 1970, Ser. No. 40,592

Claims priority, application Switzerland, June 25, 1969, 9700/69

Int. Cl. B01d *49/00*; F23j *11/00*

U.S. Cl. 55—413 **8 Claims**



A spraying booth for facilitating the recovery of the surplus of pulverulent material used to coat an object includes at the rear means for enabling it to communicate with an air extraction installation. The booth is open at the front to give access to the gun, and is provided with a plurality of rotatable blades which when rotated into a first transverse plane move air uniformly through the rear of the booth and when rotated into a second perpendicular position may be returned to the interior of the booth without disturbing the air in the booth.

3,700,390

Patent Not Issued For This Number

3,700,391

AIR YARN TEXTURIZER

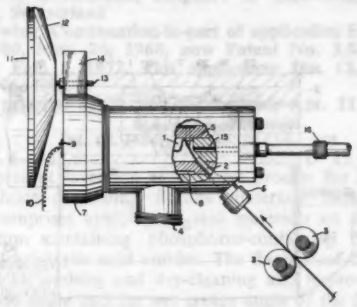
Herbert J. Pike, Martinsville, N.J., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Filed March 3, 1971, Ser. No. 120,566

Int. Cl. D02g *1/16*; D01h *7/92*

U.S. Cl. 57—77.3 **7 Claims**

An air texturizer of the type in which the yarn is fed into a chamber with a blast of air, resulting in some twisting of the yarn, and the yarn untwists as it leaves the chamber and is changed in direction, for example at right angles, resulting in the formation of loops as it untwists. More particularly, the present invention is applied to an air texturizer of the type in which yarn is overfed at an angle into a vortex chamber, with a tangential blast of air causing the yarn to spin in the form of a crank or loop and flow out axially with the air and turn its direction. The texturizer is provided with a flange in which a beveled plate on a micrometric threaded shaft is mounted with a polished beveled edge over the axial outlet of the texturizer. This permits a very accurate adjustment of distance which controls the loops on the texturized yarn and permits operating overfeed of yarn. Bulkier yarn can be produced at a high rate of speed.



3,700,392

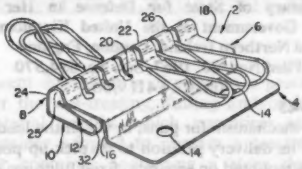
UNITARY SHEET METAL KEY LOOP RETAINER

Stuart T. Shears, Belmont, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed June 3, 1970, Ser. No. 43,075

Int. Cl. A47g *29/10*

U.S. Cl. 70—456 B **5 Claims**



A one piece sheet metal key loop retainer has a leaf spring integrally joined to the forward end of its key loop retainer section through a reversely bent bight. The leaf spring underlies each of a plurality of loop head receiving openings in the loop receiving section of the retainer and terminates in a free end lying above the loop receiving openings.

3,700,393

LIQUID BIPROPELLANT SYSTEM USING AQUEOUS HYDROXYLAMMONIUM PERCHLORATE OXIDIZER

Kurt F. Mueller, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 28, 1969, Ser. No. 880,458

Int. Cl. C06d *5/08*

U.S. Cl. 60—214 **23 Claims**

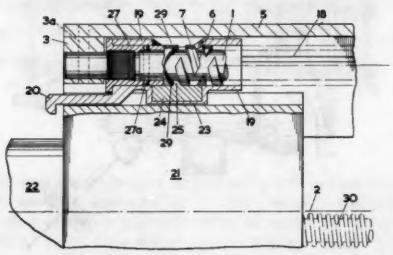
A bipropellant system based on a liquid oxidizer of a concentrated aqueous hydroxylammonium perchlorate solution and a liquid fuel.

3,700,394

COCKING MECHANISMS FOR GUNS

Norman Trevor Brint, Essex, England, assignor to The Secretary of State for Defense in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 28, 1967, Ser. No. 686,356
Int. Cl. F41d *11/00*
U.S. Cl. 89—1 K **6 Claims**



A cocking mechanism for a gun, comprising a rotary shaft, carried by the mounting and having intersecting right and left-handed screw-threads and a coacting retractor member which, on rotation of the shaft, retracts the recoiling parts of the weapon, as a result of its interaction with one screw-thread, to cock certain mechanisms; whereafter run-out occurs under the influence of spring action accompanied by interaction between the retractor member and the reverse thread. The first screw-thread may be of slow pitch to give a mechanical advantage to the operator and the reverse thread of steeper pitch to give a mechanical advantage in favor of the springs.

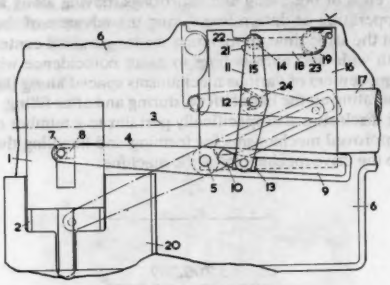
3,700,395

LOADING MECHANISM FOR GUNS

Norman Trevor Brint, Waltham Abbey, England, assignor to The Secretary of State for Defense in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 20, 1967, Ser. No. 684,570
Int. Cl. F41f *9/06*
U.S. Cl. 89—45 **8 Claims**

A loading mechanism for guns, in which the loading tray is moved from its delivery position to its pick-up position by a pair of levers mounted on separate, fixed fulcrums on the gun mounting the levers also being pivotally connected, the first to the loading tray and the second to a member slidable along the first lever. The second lever is engaged and rotated, on recoil of the gun, by a recoiling part to actuate the loading tray.

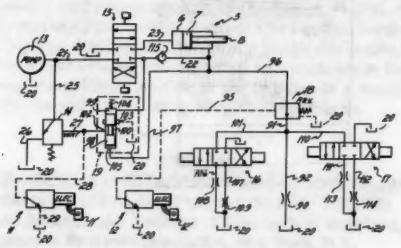


3,700,396

ELECTRO-HYDRAULIC FLOW CONTROL CIRCUIT

Cecil E. Adams, Columbus, Ohio, assignor to Abex Corporation, New York, N.Y.

Division of Ser. No. 16,363, March 4, 1970, Pat. No. 3,636,977. This application June 16, 1971, Ser. No. 153,891
Int. Cl. F15b *13/02*, *13/044*
U.S. Cl. 91—449 **23 Claims**



An electronically programmable pressure and flow control hydraulic circuit. The circuit comprises a pair of electronically programmable pressure control valves, one of which is cooperable with a pressure reducing valve and one or more orifices to control flow through the circuit and the other of which controls pressure in the circuit. When the circuit is used in combination with a hydraulic ram or motor, it enables both the force and speed of the ram or motor to be electronically controlled and programmed.

CHEMICAL

3,700,397

CAMOUFLAGED ARTICLE AND METHOD OF PRODUCING SAME

Alvin O. Ramsley, Sherborn, and John T. Walwood, Lowell, Mass., assignors to the United States of America as represented by the Secretary of the Army

Filed May 6, 1969, Ser. No. 822,218
Int. Cl. D06p *3/00*; F41h *3/00*
U.S. Cl. 8—4 **10 Claims**

Method of camouflaging dyeable materials against daylight or nighttime detection comprising dyeing the material with a dye composition producing a desired shade in the visible range of the spectrum and fluorescence in the near infrared range from 0.70 to 0.90 micron wavelength, and over-printing the dyed material with lines of a printing composition containing an energy absorbent pigment, such as carbon; and camouflaged articles produced by the method.

3,700,398

PROCESS FOR DYEING ACID-MODIFIED NYLON FIBERS

John Elton Cole, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed July 27, 1970, Ser. No. 58,709
Int. Cl. D06p *3/82*
U.S. Cl. 8—21 B **5 Claims**

Acid-modified bulk continuous filament nylon fibers can be dyed in blue to turquoise shades with biscationic anthraquinone dyes prepared by quaternizing the biscondensation product of an N,N-disubstituted C_{2-4} alkylenediamine and quinizarin or 1,4,5,8-tetrahydroxyanthraquinone. The biscationic dyes have excellent reserve on unmodified nylon fibers and fibers so dyed have sufficient light fastness for use in nylon styling carpeting.

3,700,399

METHOD OF DYEING TEXTILE FIBERS WITH AN ANIONIC DYESTUFF IN THE PRESENCE OF A QUATERNARY AMMONIUM SALT

Shiro Shimauchi, Takatsuki, and Yuko Kitamura, Osamu Iwabuchi, and Takeshi Matsui, Ibaraki, Japan, assignors to Teijin Limited, Osaka, Japan

No Drawing. Continuation-in-part of application Ser. No. 609,309, Jan. 16, 1967. This application Apr. 13, 1970, Ser. No. 28,121

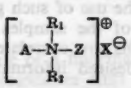
Claims priority, application Japan, Jan. 22, 1966, 41/3,552

The portion of the term of the patent subsequent to May 10, 1987, has been disclaimed

Int. Cl. D06p *1/36*

U.S. Cl. 8—30 4 Claims

In the dyeing of hydrophobic fibers such as polyvinyl chloride fiber, polyacrylonitrile fiber, modified polyester fiber and cellulose acetate fiber with an anionic dyestuff, a method of further enhancing the dyeability of those of the said fibers which have in themselves a dyeing site for an anionic dyestuff and of making dyeable those of the said fibers which have hitherto had no dyeing site for an anionic dyestuff by the conjoint use of a compound of the following formula:



R_1, R_2: lower alkyl or lower allyl,
Z: benzyl or naphthyl (may be substituted),
A: butyl, or phenyl (may be substituted),
X: halogen or lower alkyl sulfonic acid residue.

3,700,400

SILICONE-POLYALKYLENE OXIDE BLOCK COPOLYMER SUPPRESSING FOAM IN JET DYEING

William Wilson Cuthbertson, Saltcoats, Scotland, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed May 3, 1971, Ser. No. 139,812

Int. Cl. D06p *1/68*

U.S. Cl. 8—83 10 Claims

Antifoam compositions consisting of silica-containing siloxane/oxyalkylene copolymers which are particularly suitable for jet dyeing.

3,700,401

DETERGENT COMPOSITIONS

William Gilbert Spangler, 14 Charles Place, Chatham, N.J. 07928, and Henry Daniel Cross III, Box 242A, Heyer's Mill Road, Colts Neck, N.J. 07722

No Drawing. Continuation-in-part of application Ser. No. 642,729, June 1, 1967. This application Oct. 30, 1970, Ser. No. 85,822

Int. Cl. D06l *3/06*

U.S. Cl. 8—108 1 Claim

Built detergent composition for heavy duty washing of clothing in the presence of added hypochlorite. The composition contains an organic detergent, a builder salt, a small amount of sodium bromide or other alkali metal bromide, and preferably an enzyme material.

3,700,402

RESIST PRINTING UNDER REACTIVE DYE WITH ALKALI HYDROXY METHANE SULFONATE OR AMINO AND AMIDO METHANE SULFONATE

Masajiro Noda, deceased, late of Kyoto, Japan, by Hideyo Noda, heir, Kyoto, Hiroyuki Kajita, Osaka, and Koji Kuwayama, Shiga, Japan, assignors to Meisei Chemical Works, Ltd., Kyoto, Japan

No Drawing. Continuation-in-part of abandoned application Ser. No. 607,146, Jan. 4, 1967. This application June 29, 1970, Ser. No. 50,917

Int. Cl. D06p *5/00*

U.S. Cl. 8—65 12 Claims

A resist process for dyeing fibers by printing on a fiber a resisting agent such as an alkali hydroxy methane sulfonate or a substance capable of producing an alkali hydroxy methane sulfonate followed by treatment with a reactive dye and subsequent dye fixing treatment.

3,700,403

PROCESS FOR FLAMEPROOFING CELLULOSE-CONTAINING FIBROUS MATERIALS

Hermann Nachbur, Dornach, and Arthur Maeder, Therwil, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 715,980, Mar. 26, 1968, now Patent No. 3,639,539, dated Feb. 1, 1972. This application Jan. 12, 1971, Ser. No. 105,977

Claims priority, application Switzerland, Apr. 11, 1967, 5,131/67

Int. Cl. D06m *13/32, 15/54*

U.S. Cl. 8—115.6 12 Claims

The present invention relates to a process for rendering cellulose-containing fibrous materials flameproof, which comprises applying to said materials an aqueous preparation containing phosphorus-containing N,N-dimethylolcarboxylic acid amides. The flameproof finish is resistant to washing and dry-cleaning and improves the dry crease angle and the wet crease angle of the finished material.

3,700,404

PROCESS AND APPARATUS FOR THE WET TREATMENT OF EXPANDED TEXTILE MATERIAL LENGTHS

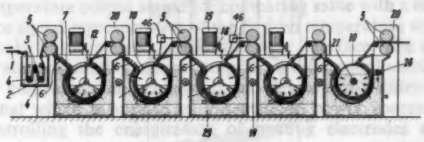
Ingo Janisch, Osterreich, and Heinz Fleissner, Frankfurt, Germany, assignors to Vepa AG, Basel, Switzerland

Filed Apr. 8, 1970, Ser. No. 26,708

Claims priority, application Germany, Apr. 8, 1969, P 19 17 770.9; Dec. 13, 1969, P 19 64 343.7

Int. Cl. D06f *17/02*; B05c *3/134, 8/04*

U.S. Cl. 8—158 35 Claims



The present disclosure is directed to a process and apparatus for the wet-treating, fulling and/or kneading of textile material lengths which comprises at least one liquor container adapted to contain a treatment liquor, said liquor container containing a sieve drum means, rotatably disposed therein, drive means for rotating said sieve drum means, a liquid-permeable trough means provided in the liquor container and extending a distance from the surface of the sieve drum means, said trough means and the surface of said sieve drum means defining a compression channel therebetween, inlet means for overfeeding the material to be treated to the compression channel thereby plaiting the material at the beginning of said channel, means for supporting and driving the sieve drum means so that it performs an oscillating motion during rotation, thereby subjecting the plaited material length in the compression channel to a mechanical treatment due to the varying compression force of the sieve drum means against the plaited material in said compression channel, and outlet means for removing the plait-like overfeed at the outlet of the compression channel. The present disclosure is also directed to the combination of the wet-treatment process and apparatus with an acidifying, a carbonizing, a padding, and a drying process and apparatus.

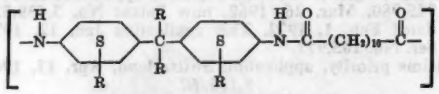
3,700,405

DYEING OF POLYCARBONAMIDES OF BIS(PARA-AMINO-CYCLOHEXYL)METHANE AND DODECANEDIODIC ACID WITH ANIONIC DYES

Anthony M. Petite, Yonkers, and Clive E. Thornley, Spring Valley, N.Y., assignors to Ciba-Geigy Corporation, Greenburgh, N.Y.

No Drawing. Filed Dec. 29, 1970, Ser. No. 102,518
Int. Cl. D06p 5/04
U.S. Cl. 8—173 6 Claims

Processes are provided for the dyeing of silk-like linear, high molecular weight polyamide fibers containing at least 90% repeating units of the formula



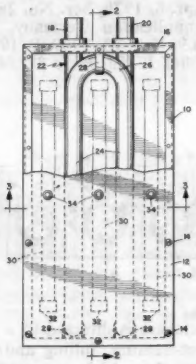
wherein R is the same or different member of the class consisting of hydrogen and methyl with selected anionic dyestuffs under acidic conditions and temperatures of between about 180° to 212° F. By use of selected organic carriers, the use of pressure is not required.

3,700,406

STERILIZER UNIT FOR FLUID MEDIA

Alfred Landry, 7589 Calvocado Drive, Lemon Grove, Calif. 92045

Continuation-in-part of abandoned application Ser. No. 728,408, May 13, 1968. This application Mar. 12, 1971, Ser. No. 123,869
Int. Cl. A61l 1/00, 3/00
U.S. Cl. 21—54 R 11 Claims



In a sterilizer unit for fluid media wherein a transparent pipe is used to conduct the fluid media and a source of germicidal radiation is used to irradiate the fluid media through the pipe, the improvement disclosed comprises the use of a pipe composed of fluorinated ethylene propylene in combination with ultraviolet lamps. Impurities contained in the fluid media being treated do not stick thereby prohibiting film buildup on the inner surface thereof so that the unit is operational over extended periods of time. In addition, decomposition of the fluid conducting pipe is avoided under extended exposure to ultraviolet rays.

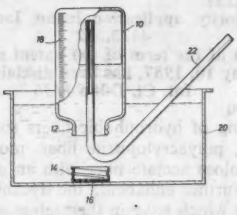
3,700,407

METHOD OF GEOCHEMICAL PROSPECTING

Leo Horvitz, 8116 Westglen Drive, Houston, Tex. 77042

Filed June 30, 1969, Ser. No. 837,800
Int. Cl. G01n 33/24
U.S. Cl. 23—230 EP 5 Claims

A method of geochemical prospecting by the taking of samples of the earth formation at spaced locations, in an area to be investigated, which samples are analyzed to determine the concentration therein of significant hydrocarbon gas leakage products from subterranean petroliferous deposits and the results of such analyses correlated with sample location to provide information concerning the presence of such deposits in the area.



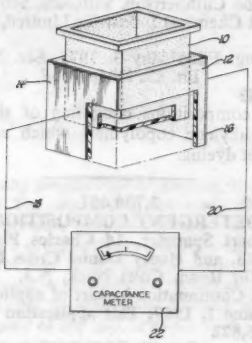
The method includes the taking of soil samples in a manner to obtain and preserve non-adsorbed, pore gases in the samples and the use of such gases with or without the adsorbed gases of the samples in carrying out the analyses whose results are correlated with sample location to obtain the desired information.

3,700,408

BLOOD CELL AGGREGOMETER

Haim I. Bicher, Charleston, S.C., assignor to Transidyne General Corporation, Ann Arbor, Mich.

Filed Dec. 30, 1970, Ser. No. 102,626
Int. Cl. G01n 27/22, 33/16, 27/26
U.S. Cl. 23—230 B 5 Claims



Method for evaluating coagulants and anticoagulants for blood by measuring the capacitive changes of a blood sample to which such quantities are added.

3,700,409

SPOT TEST FOR IDENTIFICATION OF OIL CONTAMINANTS IN WATER

David M. Zall, Annapolis, Md., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Apr. 23, 1971, Ser. No. 137,046
Int. Cl. G01n 21/00
U.S. Cl. 23—230 R 1 Claim

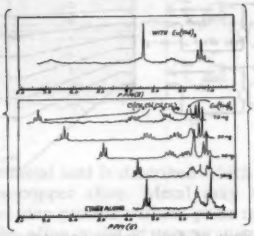
Method of detecting a hydrocarbon contaminant in an aqueous solution by applying chromic-sulfuric acid to filter paper wetted by the aqueous solution. A positive test is indicated by the development of a bluish-green color.

3,700,410

RARE EARTH COMPLEXES AS NUCLEAR MAGNETIC RESONANCE SHIFT REAGENTS

Robert E. Sievers, 2628 N. Emerald Drive, Fairborn, Ohio 45324

Filed Sept. 24, 1971, Ser. No. 183,488
Int. Cl. C07p 5/00; G01m 27/78
U.S. Cl. 23—230 R 11 Claims



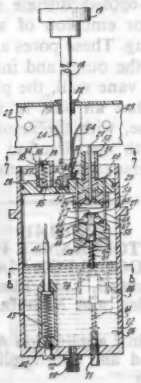
A lanthanide chelate of a fluorinated ligand is used as a nuclear magnetic resonance shift reagent for spectral simplification and clarification. Since the use of the shift reagents of this invention facilitates compound identification and increases the scope of the applicability of nuclear magnetic resonance spectroscopy, the present invention is particularly useful in detecting and analyzing compounds which are or may be pollutants.

3,700,411

GAS ANALYZER

Robert Davis, Far Rockaway, N.Y., assignor to Combustion Equipment Associates, Inc., New York, N.Y.

Filed Apr. 30, 1971, Ser. No. 139,107
Int. Cl. G01n 1/24, 27/06, 31/00
U.S. Cl. 23—254 E 10 Claims



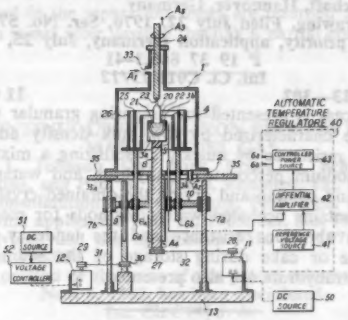
A gas analyzer especially suitable as a portable analyzer to accurately measure the quantity of pollutants in the air. Means are provided for accurately sampling a predetermined quantity of air for highly accurate reproducibility of results. The pollutants to be measured are dissolved in a fluid and the conductivity of the fluid is measured and correlated to the quantity of pollutants in the air.

3,700,412

CRYSTAL PULLING APPARATUS HAVING MEANS FOR MAINTAINING LIQUID SOLID CRYSTAL INTERFACE AT A CONSTANT TEMPERATURE

Seiya Higashi and Kenro Kobayashi, Tokyo-to, Japan, assignors to Kokusai Denki Kabushiki Kaisha, Tokyo-to, Japan

Filed Nov. 26, 1969, Ser. No. 880,111
Claims priority, application Japan, Dec. 6, 1968, 43/89,142
Int. Cl. B01j 17/18
U.S. Cl. 23—273 SP 9 Claims



Apparatus for growing crystals comprises a crucible for holding molten raw material to be grown into a crystal, means including a shaft for placing a seed crystal in the molten raw material to promote crystal growth, temperature sensing means including a movable thermocouple for measuring the temperature of the boundary interface existing between the grown crystal and the molten raw material and providing a corresponding temperature output signal, and temperature regulating means receptive of the temperature output signal for comparing same with a reference signal representative of the desired temperature which should be maintained at the boundary interface. The temperature regulating means comprises a differential amplifier for comparing the two signals and developing a difference signal which is applied to a controlled power source for controlling the energization of heating electrodes of a heater. In order to stabilize the temperature at the boundary interface, the thermocouple is mounted for movement integrally with the heater and in synchronization with the lowering movement of the boundary interface and actuating means is provided for effecting movement of both the thermocouple and heater in accordance with the lowering rate of the boundary interface to maintain the thermocouple at a constantly spaced-apart distance from the boundary interface thereby providing a more accurate temperature sensing function and resulting in a more stabilized crystal growth.

3,700,413

PROCESS FOR MAKING EXTRA-PURE ARSENIC BY SUBLIMATION IN THE PRESENCE OF CARBON OR BORON

Klaus Bienert, Winfried Lang, Egon Nordt, and Herbert Weidner, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe m.b.H., Burghausen, Upper Bavaria, Germany

No Drawing. Filed Apr. 26, 1971, Ser. No. 137,588
Claims priority, application Germany, Apr. 30, 1970, P 20 21 332.5; Jan. 22, 1971, P 21 03 066.0
Int. Cl. B01d 7/00; C22b 33/00
U.S. Cl. 23—294 6 Claims

Process for making extra-pure arsenic which is particularly low in silicon and oxygen content, which comprises

sublimating a mass of arsenic in the presence of a comminuted surface-active or surface-reactive substance such as carbon or boron, preferably in spectrally pure form.

3,700,414

PROCESS FOR THE PREPARATION OF GRANULAR SODIUM PERBORATE TETRAHYDRATE OF LOW BULK DENSITY AND HIGH ABRASION RESISTANCE

Helmut Dillenburg, Bad Honningen, Helmut Honig, Sehnde, and Wilhelm Moser, Ariendorf, near Honningen, Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

No Drawing. Filed July 22, 1970, Ser. No. 57,310
Claims priority, application Germany, July 25, 1969, P 19 37 805.3-41
Int. Cl. C01b *15/12*
U.S. Cl. 23—302 11 Claims

A process is presented for preparing granular sodium perborate characterized by low bulk density and high abrasion resistance by quickly crystallizing a mixture of molten sodium perborate tetrahydrate and water while stirring and cooling and drying the obtained crystallisate which contains occluded water. Methods for measuring both the abrasion resistance and the tendency to agglomerate or cake during storage of the sodium perborate tetrahydrate are also presented.

3,700,415

VANADIUM RECOVERY FROM WET PROCESS PHOSPHORIC ACID USING NEUTRAL ORGANOPHOSPHORUS EXTRACTANTS

Ernest L. Koerner, Jr., and Michael F. Lucid, Oklahoma City, Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

No Drawing. Filed Feb. 18, 1970, Ser. No. 12,432
Int. Cl. B01d *11/04;* C01g *25/22*
U.S. Cl. 23—312 ME 13 Claims

A method for the extraction of vanadium (V) from acidic mixtures containing fluoride, phosphate and vanadium comprising effecting the extraction with a neutral organophosphorus complexing agent in a water-immiscible organic solvent, the vanadium being complexed with the complexing agent and being extracted into the organic phase.

3,700,416

EXTRACTION OF VANADIUM AND COPPER WITH FLUORINATED BETA-DIKETONES

Michael F. Lucid, Oklahoma City, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

No Drawing. Filed Sept. 4, 1970, Ser. No. 69,950
Int. Cl. B01d *11/04;* C01g *3/00, 31/00*
U.S. Cl. 23—312 R 7 Claims

A method for the extraction of metals from aqueous acidic solutions is provided which comprises extracting the metals with a fluorinated β-diketone in an organic solvent, the metal being extracted into the organic phase.

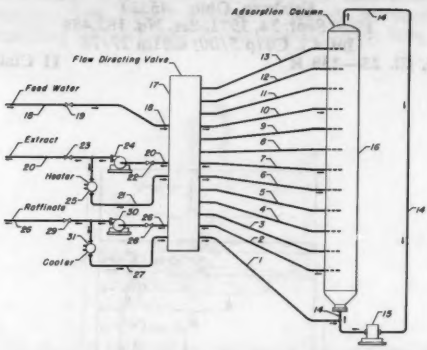
3,700,417

DUAL TEMPERATURE FIXED CARBON BED HEAVY WATER CONCENTRATION PROCESS

Donald B. Broughton, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 4, 1968, Ser. No. 773,213
Int. Cl. B01d *15/00;* C01b *5/02*
U.S. Cl. 23—312 W 2 Claims

A process for the concentration of a deuterium-containing water stream from a mixture of natural water. A feed stream is contacted with an adsorbent at relatively low temperature conditions to effect adsorption of heavy water by the adsorbent. The heavy water is recovered in a relatively high temperature desorption step. The process is operated in a continuous manner with the



general net flow of feed being countercurrent to the adsorbent.

3,700,418

COOLED AIRFOIL AND METHOD OF MAKING IT

Thomas H. Mayeda, Speedway, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1969, Ser. No. 879,094
Int. Cl. B26f *1/00;* C23b *1/02;* F03b *3/00*
U.S. Cl. 29—180 SS 10 Claims

A transpiration-cooled turbine vane or the like has numerous pores for emission of air from the vane for transpiration cooling. These pores are produced by photoetching pits from the outer and inner faces of the outer metal layer of the vane wall, the pits being offset so that their intersection has an axis at an acute angle to the surface of the vane, with the result that the air emitted flows generally with the direction of flow past the vane rather than transverse to the direction of flow.

3,700,419

SMOOTH HIGH TOLERANCE POROUS TUBE AND PROCESS FOR MAKING

Frederick J. Sorgenfrei, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

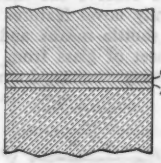
No Drawing. Original application Aug. 28, 1969, Ser. No. 853,972. Divided and this application Jan. 25, 1971, Ser. No. 109,696
Int. Cl. B22f *1/00*
U.S. Cl. 29—182.2 3 Claims

Several beneficial properties are achieved by centripetally mechanically working as by rotary swaging of porous metal tubing particularly prepared from sintered powdered metals. These include excellent dimensional tolerance, excellent surface finish, controlled densification depending on the amount of reduction, increased strength and yet the overall porosity of the tube is retained to a very considerable extent. The internal surface retains its initial rough structure.

3,700,420
CERAMIC-TO-METAL SEAL

Robert H. Bristow, Ballston Lake, N.Y., assignor to General Electric Company

Filed Apr. 1, 1971, Ser. No. 130,265
Int. Cl. B32b *15/04*
U.S. Cl. 29—195 3 Claims



A ceramic-to-metal seal is described which comprises a silver-manganese-copper alloy. Metal may be sealed to ceramic in a one step process without prior metallizing of the ceramic. The alloy melts at temperatures which are sufficiently below the melting point of silver to enable one to seal silver-plated metal parts to ceramic without melting the silver plating.

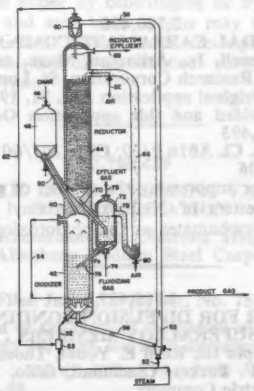
ERRATUM

For Class 29—203 B see:
Patent No. 3,700,567

3,700,421
APPARATUS FOR CONDUCTING A CONTINUOUS STEAM-IRON PROCESS

James L. Johnson, Oak Park, Frank C. Schora, Jr., Palatine, and Paul B. Tarman, Elmhurst, Ill., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Original application Feb. 11, 1969, Ser. No. 798,334. Divided and this application Feb. 17, 1971, Ser. No. 116,051
The portion of the term of the patent subsequent to Nov. 9, 1988, has been disclaimed
Int. Cl. C10j *3/20*
U.S. Cl. 48—73 2 Claims

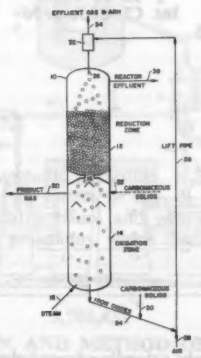


Apparatus is provided for conducting a continuous steam-iron process wherein finely divided iron oxides are reduced in a reduction vessel and the reduced iron oxides are reacted with steam in an oxidation vessel to make hydrogen. The reduction of the iron oxides is effected by means of a continuously recirculating stream of hot, finely divided carbonaceous solids which are mixed with the iron oxides in a downwardly moving bed under reducing conditions, and heat is supplied by the carbonaceous solids which are heated by partial combustion outside the reduction vessel. The mixture of reduced iron oxides and carbonaceous solids from the reduction vessel is separated in a separation vessel into a stream of reduced iron oxides and a stream of carbonaceous solids. The stream of reduced iron oxides is conducted to the oxidation vessel where the reduced iron oxides react with steam to reoxidize the reduced iron oxides. The latter are returned to the reduction vessel. The carbonaceous solids separated in the separation vessel are returned to the reduction vessel after passage through a partial combustion zone.

3,700,422
CONTINUOUS STEAM-IRON PROCESS FOR MAKING FUEL GAS

James L. Johnson, Oak Park, Frank C. Schora, Jr., Palatine, and Paul B. Tarman, Elmhurst, Ill., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Original application Feb. 11, 1969, Ser. No. 798,334. Divided and this application Feb. 17, 1971, Ser. No. 116,054
The portion of the term of the patent subsequent to Nov. 9, 1988, has been disclaimed
Int. Cl. C10j *3/20*
U.S. Cl. 48—197 R 10 Claims



In a continuous steam-iron process wherein finely divided iron oxides are reduced in a reduction zone and the reduced iron oxides are reacted with steam and hydrocarbonaceous solids in an oxidation zone to make fuel gas, the reduction of the iron oxides is effected by means of a continuously recirculating stream of hot, finely divided carbonaceous solids which are mixed with the iron oxides in a downwardly moving bed under reducing conditions, and heat is supplied to the reduction zone by the carbonaceous solids which are heated by partial combustion outside the reduction zone. In the preferred embodiment of the process, the mixture of reduced iron oxides and carbonaceous solids from the reduction zone is separated in a fluidized separation zone into a stream of reduced iron oxides and a stream of carbonaceous solids. The stream of reduced iron oxides is conducted to the oxidation zone where the reduced iron oxides fall through a fluidized bed of hydrocarbonaceous solids in countercurrent flow relationship to steam, whereby a product gas is produced which contains methane by virtue of the reaction of the hydrogen (produced by the steam-iron reaction) with the hydrocarbonaceous solids.

3,700,423

METHOD OF MAKING A LENS BALANCED LASER ROD AND ROD PRODUCED THEREBY

Joseph W. Kantorski, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

No Drawing. Filed Apr. 28, 1969, Ser. No. 819,992
Int. Cl. C03c *15/00*; C03b *21/00*; H01s *3/00*
U.S. Cl. 65—30 6 Claims

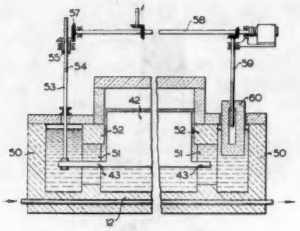
A laser rod, having a length to lateral dimension ratio of at least about 1 to 1 or greater, is formed of an unannealed glass having an active laser ingredient, and the rod, made to desired dimensions, during its manufacture is cooled in such a manner that there is a gradient of strain from the surface to the center and between the ends, producing a zero lens effect at high repetition rates where the resonant optical energy produces high temperatures in the rod. The rod is produced with a negative lens effect, at least at sections intermediate the opposed ends, which is substantially equal to the positive lens effect produced by expansion of the rod due to the heating derived from optical pumping, taking into consideration the differential cooling effect from the exterior surface inwardly of the rod.

3,700,424

WEIR-LIKE BODY EXTENDING FROM BELOW INTO A BODY OF MOVING MOLTEN GLASS

Michel Pernet, Porz-Grengel, Germany, assignor to Erste Deutsche Floatglas G.m.b.H. & Co. OHG, Porz-Cologne, Germany

Filed Dec. 24, 1969, Ser. No. 887,998
Claims priority, application Germany, Jan. 4, 1969, P 19 00 389.5
Int. Cl. C03b *5/26*
U.S. Cl. 65—333 9 Claims



A weir-like body extending from below into a body of moving molten glass is supported in a mass of molten material underneath the glass so as to allow vertical adjustment of the position of the body.

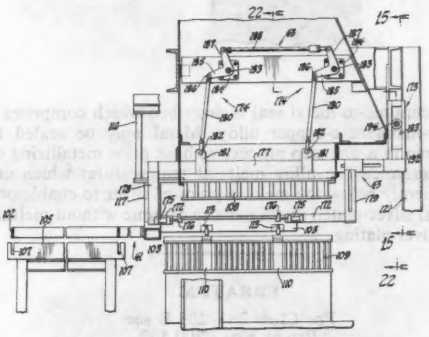
3,700,425

APPARATUS FOR CONVEYING GLASS SHEETS THROUGH ADJACENT BENDING AND TEMPERING STATIONS

Harold A. McMaster, Woodville, Ohio, assignor to Guardian Industries Corporation, Detroit, Mich.

Original application Dec. 18, 1967, Ser. No. 691,326. Divided and this application Apr. 12, 1971, Ser. No. 132,943
Int. Cl. C03b *27/00*
U.S. Cl. 65—348 22 Claims

An apparatus for curving a sheet of glass including a furnace having an elongated gas support bed for supporting sheets of glass thereover, conveying means for moving a sheet from the first end to the second end of the bed, a bending station disposed adjacent the second end of the bed and including a sheet supporting surface for supporting a sheet of glass on gases thereover, a shuttle means for moving a sheet of glass from the second end of the bed to the gas supporting surface in the bending station, a blasthead adjacent the bending station for impinging fluid against opposite sides of the sheet for cooling thereof, oscillating means in the blasthead for oscillating a sheet therein, and unitary frame means for lifting a sheet from the gas supporting surface in the bending station for bending the sheet and for thereafter moving the sheet into the blasthead while at the same time removing a sheet from the oscillating means in the blasthead to remove the sheet from the blasthead. The independently novel features of the conveying assembly are the shuttle means and its specific structure for moving a sheet of glass from the furnace to the bending station, the single unitary frame means for



supporting a sheet in the bending station and moving it into the blasthead while simultaneously removing a sheet from the blasthead, the unique support of the forming surface means in the bending station against which a sheet is pressed for curving thereof, and an oscillating means in the blasthead for removing a sheet from the frame means and oscillating the sheet in the blasthead while it is being cooled, the latter being the claimed subject matter of this application with various other of the disclosed features claimed in co-pending applications Ser. No. 132,941 filed Apr. 12, 1971 and Ser. No. 133,092 filed Apr. 12, 1971 both also divisional applications of U.S. Pat. 3,607,200.

3,700,426

HERBICIDAL CARBAMATE COMPOUNDS

John H. Cornell, Jr., Arlington, Mass., assignor to Monsanto Research Corporation, St. Louis, Mo.

No Drawing. Original application Apr. 21, 1966, Ser. No. 544,100. Divided and this application Oct. 1, 1968, Ser. No. 798,493
Int. Cl. A01n *9/20*; C07c *101/00*
U.S. Cl. 71—106 4 Claims

A method for suppressing the growth of pigweed employing alkyl esters of N-alkoxy carbonyl alkylene-N-dialkoxymethylcarbamates as the phytotoxicants.

3,700,427

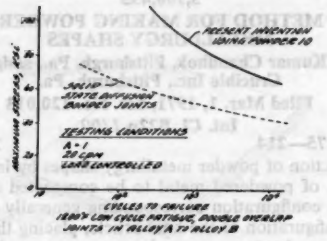
POWDER FOR DIFFUSION BONDING OF SUPERALLOY MEMBERS

George S. Hoppin III, Reed E. Yount, Thomas F. Berry, and James F. Barker, Cincinnati, Ohio, assignors to General Electric Company

Original application July 11, 1969, Ser. No. 841,093, now Patent No. 3,632,319. Divided and this application Mar. 26, 1971, Ser. No. 128,458
Int. Cl. B22f *9/00*; C22c *19/00, 19/02*
U.S. Cl. 75—.5 R 5 Claims

An improved diffusion bonded, age hardenable joint between superalloy members results from a method which

combines the benefits of vacuum high temperature brazing and pressure solid state diffusion bonding through use of an age hardenable bonding powder related to the super-


PRESENT INVENTION USING POWDER 10
SOLID STATE DIFFUSION BONDED JOINTS
TESTING CONDITIONS
A-1
20 CPM
LOAD CONTROLLED
CYCLES TO FAILURE
IRON-LOW CYCLE FATIGUE, DOUBLE OVERLAP JOINTS IN ALLOY A TO ALLOY B

alloy and including temperature depressants selected from B, Si, Mn, Cb, Ta and their mixtures. The method avoids the need for pressure during the diffusion bonding portion.

3,700,428

METHOD OF PREPARATION OF ALLOYS OF REFRACTORY METALS

Etienne Bonnier, Colette Allibert, Jean Driole, and Alain Wicker, Grenoble, France, assignors to Agence Nationale de Valorisation de la Recherche, Puteaux, France

Filed May 28, 1970, Ser. No. 41,520

Claims priority, application France, May 30, 1969, 6916424

Int. Cl. C22b *57/00*; C22c *1/02*; C22d *7/06*

U.S. Cl. 75—10 R **8 Claims**

The present invention relates to a method of preparation of alloys of refractory metals, in which a solid homogeneous solution of niobium and at least one of two refractory metals such as tungsten or molybdenum is prepared under an inert atmosphere in a liquid bath of a carrier metal (nickel or copper), the said solid solution is separated from the liquid phase and the whole is rapidly cooled so as to solidify the liquid phase thus separated from the solid phase. The separation operation is carried out either by centrifuging or by electro-magnetic means and said latter means may also constitute the heating means. These alloys are especially applied to the manufacture of aeronautical parts or of superconductor devices.

3,700,429

METHOD OF CONTROLLING VACUUM DECARBURIZATION

Sundaresan Ramachandran, Natrona Heights, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Jan. 5, 1970, Ser. No. 751

The portion of the term of the patent subsequent to July 20, 1988, has been disclaimed

Int. Cl. C21c *5/34, 7/10*

U.S. Cl. 75—49 **4 Claims**

A method of controlling vacuum decarburization of molten steel wherein the ambient pressure within the vessel within which the decarburization is being performed is monitored and compared with an expected pressure calculated from known decarburization reaction parameters to reflect the effectiveness of the decarburization process and the pressure within the vessel or inputs to the reaction are readjusted in order to establish an efficient decarburization reaction while minimizing the oxidation of desired metallic values within the steel.

3,700,430

PROCESS FOR THE MANUFACTURE OF POTASSIUM

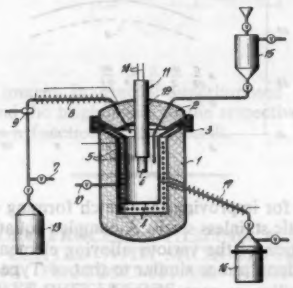
Uwe Landt, Hurth, near Cologne, Helmut Seifert, Hermulheim, near Cologne, and Otto Bretschneider, Kirchzarten, Black Forest, Schwarzwald, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

Filed May 27, 1970, Ser. No. 41,016

Claims priority, application Germany, June 25, 1969, P 19 32 129.0

Int. Cl. C22b *27/00*

U.S. Cl. 75—66 **9 Claims**



Production of metallic potassium. K_2SO_4 placed in a reactor is reduced by means of iron in the presence of CaO under reduced pressure and with supply of heat, and the resulting potassium, which distils over, is condensed.

3,700,431

PREPARATION AND METHOD OF FEEDING COPPER CONCENTRATES AND METHOD OF TAPPING COPPER IN THE CONTINUOUS SMELTING AND CONVERTING PROCESS

Nickolas J. Themelis, Beaconsfield, Quebec, and Peter Tarassoff, Dollard des Ormeaux, Quebec, Canada, assignors to Noranda Mines Limited, Toronto, Ontario, Canada

No Drawing. Application Apr. 14, 1969, Ser. No. 832,529, now abandoned, which is a continuation-in-part of application Ser. No. 627,851, Apr. 3, 1967, now Patent No. 3,561,951. Divided and this application Dec. 29, 1970, Ser. No. 102,564

Claims priority, application Great Britain, Apr. 28, 1966, 18,647/66

The portion of the term of the patent subsequent to Feb. 9, 1988, has been disclaimed

Int. Cl. C22b *15/00, 15/06, 15/14*

U.S. Cl. 75—73 **8 Claims**

In a continuous process for smelting and converting copper concentrates to metallic copper, improvements in terms of minimizing the dust loss from the concentrates can be achieved by feeding the concentrates in the form of pellets. The feeding of the pellets and the injection of oxidizing gas used in such process may be so controlled

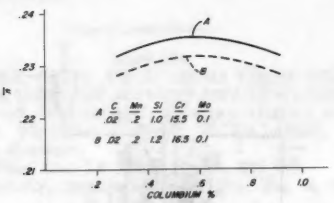
as to provide smelting rates of between about one hundred pounds and about three hundred pounds per square foot of bath surface per hour. Dust losses may be maintained between about 0.85% and 2.14% by weight of the concentrated fed into the furnace. Pellets having an average size of between about ⅜ inch and ½ inch with a moisture content of about 9% may advantageously be used.

3,700,432

FERRITIC STAINLESS STEELS WITH IMPROVED STRETCH-FORMING CHARACTERISTICS

Kenneth G. Brickner, O'Hara Township, Allegheny County, Pa., assignor to United States Steel Corporation

Filed Aug. 11, 1970, Ser. No. 62,934
Int. Cl. C22c *39/14*
U.S. Cl. 75—126 C 7 Claims



A method for improving the stretch forming characteristics of ferritic stainless steels. A complex equation shows the interrelation of the various alloying elements. Within the compositional range similar to that of Type 430 steel, the stretchability, as represented by $\bar{n}$ value, may be increased by decreasing the C, Mn, and Cr and increasing the Si. Further enhancement may be achieved by additions of Cb, with a maximum at 0.6% Cb. Mo is shown to be detrimental to high $\bar{n}$ value, and if employed for its corrosion enhancement, the C and Mn must be further decreased.

3,700,433

ENHANCEMENT OF TRANSVERSE PROPERTIES OF DIRECTIONALLY SOLIDIFIED SUPERALLOYS

David N. Duhl, Newington, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

No Drawing. Filed July 12, 1971, Ser. No. 161,912
Int. Cl. C22c *19/00*
U.S. Cl. 148—32.5 4 Claims

The mechanical properties of the columnar-grained, nickel-base superalloys in the transverse direction are significantly improved by the addition thereto of about 1 percent zirconium.

3,700,434

TITANIUM-NICKEL ALLOY MANUFACTURING METHODS

Stanley Abkowitz, Lexington, Mass. (8 A St., Burlington, Mass. 01803), and John M. Siergiej, Wayland, and Ronald R. Regan, Revere, Mass.; assignors to said Abkowitz

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,054
Int. Cl. B22f *1/00*
U.S. Cl. 75—214 7 Claims

Titanium and nickel are alloyed by a unique processing procedure to form highly useful titanium-nickel alloys such as the well-known Ti-55 Ni and Ti-60 Ni alloys. The methods include blending of powders of nickel and titanium followed by pressing and sintering to form preforms or final shapes of the desired titanium-nickel alloys.

3,700,435

METHOD FOR MAKING POWDER METALLURGY SHAPES

Vijay Kumar Chandhok, Pittsburgh, Pa., assignor to Crucible Inc., Pittsburgh, Pa.

Filed Mar. 1, 1971, Ser. No. 120,013
Int. Cl. B22p *1/00*
U.S. Cl. 75—214 14 Claims

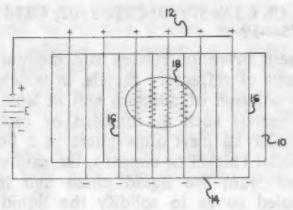
Production of powder metallurgy shapes by introducing a charge of powdered metal to be compacted to a mold having a configuration corresponding generally to the desired configuration of the final article, placing the mold in a container having a secondary pressure media therein and surrounding the mold, heating the entire assembly to an elevated temperature for compacting and isostatically compacting the powder by the application of fluid pressure while at elevated temperature.

3,700,436

ELECTRODE CONFIGURATION FOR ELECTROPHOTOGRAPHY

John D. Grier, Temperance, Mich., assignor to Owens-Illinois, Inc.

Original application Feb. 28, 1969, Ser. No. 803,553, now Patent No. 3,597,073. Divided and this application Jan. 14, 1971, Ser. No. 106,455
Int. Cl. G03g *5/00*
U.S. Cl. 96—1 R 5 Claims



A persistent internal polarization (PIP) electrophotography printing or copying system wherein a pair of opposite polarity electrodes, each including a plurality of elements disposed in spaced array alternating with each other in the same plane, are utilized in combination with a PIP layer such that an electric field may be simultaneously applied to the PIP layer while permitting light radiation to reach the PIP layer. In the specific practice, the pair of electrodes are positioned on top of or embedded in the surface of the PIP layer which is to be toned; that is, the top surface.

3,700,437

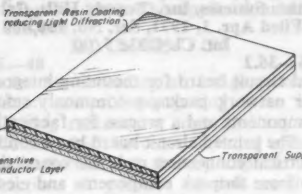
TRANSPARENT IMAGING MEDIUM

William E. Eastler, Jr., Woburn, Mass., assignor to Itek Corporation, Lexington, Mass.

Continuation-in-part of application Ser. No. 708,630, Feb. 27, 1968. This application Dec. 21, 1970, Ser. No. 76,279
Int. Cl. B44d *1/16*; G03g *5/08*
U.S. Cl. 96—1.8 13 Claims

A photographic imaging medium comprising a transparent support, a pellucid film of a particulate photosensi-

tive semi-conductor thereon preferably having a thickness of about ½ mil or less, and a transparent film over said pellucid film to decrease light diffraction thereby. The semiconductor preferably has an average particle size of about 300 mμ or less in diameter and preferably is present on the imaging medium in an amount per unit



area of about 3 grams per square meter (g./m.²) or less. Method of decreasing the diffraction of light at the surface of an imaging medium comprising a transparent support and a pellucid film of a particulate semiconductor thereon by providing said pellucid film on semiconductor with a transparent coating.

3,700,438

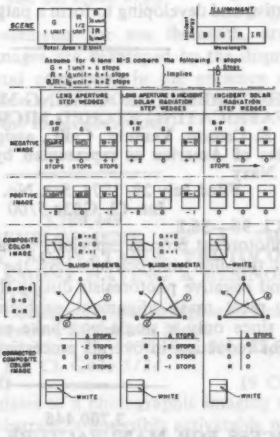
MULITSPECTRAL PHOTOGRAPHY

Edward F. Yost, Jr., Northport, N.Y., assignor to Spectral Data Corporation, Hicksville, N.Y.

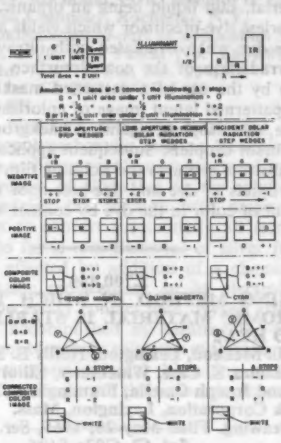
Filed Jan. 12, 1971 Ser. No. 105,839

Int. Cl. G03b *29/00*; G03c *7/00*

U.S. Cl. 96—2 **6 Claims**



A scene that has arbitrary spectral characteristics and that is illuminated by an illuminant of arbitrary spectral characteristics is photographed a plurality of times simultaneously on different areas of a strip of black-and-white film. Different regions of the electromagnetic spectrum are respectively employed in forming the several photographs. The exposures respectively associated with the photographs are adjusted so that each photograph is on a prescribed part of the characteristic curve of the film. Records of the intensity of the radiation from the scene in each of the spectral regions and of the intensity of the illuminant in each of the spectral regions are also formed. After development, the photographs are projected as images in exactly superimposed relation for viewing, and the brightnesses of the respective images are adjusted as a function of the records.



3,700,439

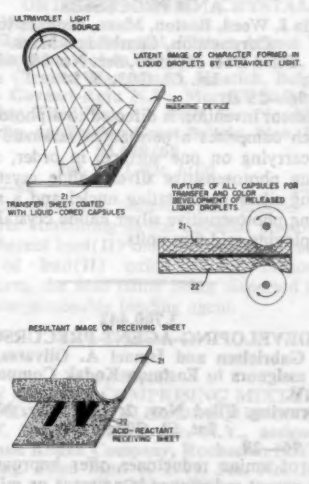
PHOTOCOPY PROCESS UTILIZING A TRANSFER SHEET COATED WITH MICROCAPSULES CONTAINING PHOTOSENSITIVE MICHLER'S KETONE DYE-PRECURSORS

Paul S. Phillips, Jr., Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Nov. 5, 1970, Ser. No. 87,026

Int. Cl. G03c *1/52, 5/04*

U.S. Cl. 96—27 R **13 Claims**



A photocopy process and photosensitive sheets for use therein, wherein a substrate sheet is made sensitive to ultraviolet light by a coating of micro-fine liquid droplets, randomly, evenly and closely distributed on a surface of

the substrate sheet, and held in isolation from each other and from the sheet and its environment by ultraviolet-transmitting, organic, polymeric, hydrophilic, film-forming material, said liquid being an organic, liquid solution of a colorless dye-precursor which yields a colorless, acid-colorable dye when irradiated with ultraviolet light. Patterned irradiation of the coated surface of the substrate sheet, as by the use of a patterned masking device, produces a patterned latent image of colorless, but now acid-colorable, dye droplets, against a background of colorless dye-precursor droplets. Subsequent application of pressure to the substrate ruptures the isolating film and exposes the liquid droplets of dye and dye-precursor material for development of color in the dye by contact with acid.

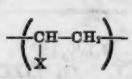
3,700,440

DODGING METHOD IN WHICH THE PHOTOCHROMIC MATERIAL IS STABLE TO LIGHT AND HEAT

Gerald L. McLeod, Lexington, Hollis E. French, Chelmsford, Laura K. Case, Winchester, Elliot Berman, Braintree, and Joseph Casella, Framingham, Mass., assignors to Itek Corporation, Lexington, Mass.

No Drawing. Filed May 20, 1965, Ser. No. 457,481
Int. Cl. G03c 5/04
U.S. Cl. 96—27 R 4 Claims

An improved photographic medium is disclosed comprising a transparent substrate with a radiation sensitive system thereon comprising a dispersion of a photochromic material in a polymeric binder containing at least 5% by weight of polar groups having the structural formulae



where X represents a hydroxyl group, an amino group, a hydroxyl ether group, an amino ether group or combinations of these. This photographic medium is useful in photographic dodging processes.

3,700,441

NOVEL PHOTOGRAPHIC PRODUCTS AND PROCESSES

Lucretia J. Weed, Boston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 31, 1969, Ser. No. 889,655
Int. Cl. G03c 5/54
U.S. Cl. 96—29 R 19 Claims

The present invention is directed to a photographic film unit which comprises a permanent laminate including a support carrying on one surface, in order, a first layer comprising photosensitive silver halide crystals, a layer comprising silver precipitating nuclei and a second layer comprising photosensitive silver halide crystals; and processes employing said film units.

3,700,442

DEVELOPING AGENT PRECURSORS

Rolf S. Gabrielsen and Ismael A. Olivares, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 2, 1970, Ser. No. 86,315
Int. Cl. C03c 5/54
U.S. Cl. 96—29 20 Claims

Esters of amino reductones offer improved solubility over the parent reductones in aqueous or mildly alkaline solutions, improved stability when provided as incorporated developing agent precursors in silver halide photographic elements, and are also useful as antioxidants and anti-stain agents. These esters of amino reductones, such as piperidino hexose reductone monoacetate, are useful photographic silver halide developing agent precursors. They can be employed in photographic compositions, elements and/or processing compositions.

3,700,443

FLATPACK LEAD POSITIONING DEVICE

William George Reimann, Los Angeles, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 1, 1971, Ser. No. 130,402
Int. Cl. G03c 5/00
U.S. Cl. 96—36.2 2 Claims

A printed circuit board for mounting integrated circuit and resistor network packages commonly referred to as flatpack components and a process for fabricating the circuit board. The printed circuit board has a conductive pattern of electrical connection pads for connecting to electrical leads from flatpack components and electrical conductors for connecting the pads to circuitry external to the board. A channel for receiving and aligning each electrical lead from a flatpack component is formed by printed circuit techniques. The surface layer of each channel is formed of solder which simplifies the process of electrically connecting flatpack leads and reduces errors occuring in the soldering process.

3,700,444

METHOD OF FORMING A CATHODE RAY TUBE SCREEN

John J. Miller and Thaddeus V. Rychlewski, Seneca Falls, N.Y., assignors to Sylvania Electric Products Inc.

Continuation of application Ser. No. 627,745, Apr. 3, 1967. This application Feb. 10, 1970, Ser. No. 9,119
Int. Cl. H01j 9/20, 31/20
U.S. Cl. 96—36.1 1 Claim

A method of pattern forming for color television picture tubes which comprises coating the face panel of a tube with a slurry of a photosensitized material and phosphor by utilizing the force of gravity and then exposng the coated panel to a suitable source of radiation through a negative and developing to form a pattern.

3,700,445

PHOTORESIST PROCESSING METHOD FOR FABRICATING ETCHED MICROCIRCUITS

Eddie B. Croson, Ventura, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed July 29, 1971, Ser. No. 167,325
Int. Cl. G03c 5/00
U.S. Cl. 96—36.2 4 Claims

A photoresist process especially suitable for fabricating etched thin-film microcircuits. By the use of both positive and negative photoresists during the same processing cycle, most mask alignment problems are eliminated. Also, since only a single post-bake period is necessary, a major reduction in overall processing time is achieved.

3,700,446

PROCESS FOR MANUFACTURE OF STRIPLINE CIRCUIT MODULES

Ernest T. Long, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed June 22, 1970, Ser. No. 48,354
Int. Cl. G03c 5/00
U.S. Cl. 96—362 3 Claims

Precision guidelines are added to the original layout of stripline circuit modules and the lines are used in subsequent steps to provide accurate alignment of the negative with a premachined circuit plate in the etching of the plate and also in subsequent inspection, etc.

3,700,447

PRODUCTION OF POSITIVE IMAGE BY DEVELOPING AN IMAGEWISE EXPOSED SEMICONDUCTOR ELEMENT WITH OXIDIZING AND REDUCING AGENTS

Leonard E. Ravich, Boston, Elliot Berman, Quincy, and Carl F. W. Ekman, Bedford, Mass.; said Ravich and said Ekman assignors to Itek Corporation, Lexington, Mass.

No Drawing. Continuation-in-part of application Ser. No. 199,211, May 14, 1962. This application May 2, 1968, Ser. No. 728,869

Int. Cl. G03c 5/24

U.S. Cl. 96—48 9 Claims

In a process for recording an image pattern of activating radiation comprising exposing to an image pattern of activating radiation a copy medium comprising a photoconductor which becomes activated upon exposure to activating radiation and thereby capable of causing chemical reactions at portions of said medium corresponding to said image pattern of activating radiation and then applying to said copy medium a chemically reactive image-producing agent, the improvement comprising: either prior to or subsequent to the exposure step applying to the copy medium the first component of a two component image-forming agent reacting on contact at said activated portions to form reaction products which are chemically non-reactive with a second component of an image-producing agent, and then applying to said medium the second component of the image-producing agent to thereby form an irreversible image in the non-exposed areas.

3,700,448

DISPROPORTIONATING IMAGEWISE DISTRIBUTION OF METALLIC NUCLEI TO FORM VISIBLE METALLIC IMAGE

Peter John Hillson, London, and Michael Ridgway, Aldbury, Tring, Herts, England, assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed July 29, 1969, Ser. No. 845,885

Int. Cl. G03c 5/24

U.S. Cl. 96—48 R 9 Claims

Processes, and elements for use therewith, are described in which images are developed by the disproportionation of a metal compound in the presence of an imagewise distribution of nuclei which accelerate the disproportionation of the metal compound.

3,700,449

PHYSICAL DEVELOPMENT OF A THIN REVERSIBLY ACTIVATABLE PHOTOCONDUCTOR ELEMENT HAVING A RESINOUS BARRIER LAYER

Harry Lerner, Lexington, Mass., assignor to Itek Corporation, Lexington, Mass.

No Drawing. Filed Mar. 23, 1970, Ser. No. 22,085

Int. Cl. G03c 5/24

U.S. Cl. 96—48 PD 19 Claims

This invention relates to a photographic imaging medium comprising a substrate, a reversibly activatable photoconductor layer preferably having a thickness of less than about 2 microns, and a water or alcohol soluble, transparent barrier layer having a low permeability to oxygen over said radiation activatable photo-conductor layer. The photographic imaging medium is characterized by the barrier layer which substantially prolongs decay time of a latent image stored in the photoconductor which latent image has been formed by exposure to a source of activating radiation. Prolonged decay time is believed to be due to the barrier layer preventing mass transport of oxygen from the atmosphere to the photoconductor.

3,700,450

REGENERATION OF BLEACH-FIX SOLUTIONS USED IN PHOTOGRAPHIC PROCESSING

Austin C. Cooley, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 8,026, Feb. 2, 1970, now Patent No. 3,634,088. This application Jan. 7, 1971, Ser. No. 104,766

Int. Cl. G03c 5/32, 5/38

U.S. Cl. 96—60 BF 3 Claims

Photographic bleach-fix solutions employing a ferric salt of an aminopolycarboxylic acid as bleaching agent and a thiosulfate as fixing agent are regenerated by reducing the concentration of silver ion in the solution to a low level and mixing the solution with oxygen in an amount sufficient to convert substantially all ferrous ion in the solution to ferric ion. Removal of silver from the solution can be effected by addition of a chemical precipitant, by metallic replacement, or by electrolytic recovery and the necessary contact with oxygen after silver removal can be accomplished by aerating the solution. Treatment of spent bleach-fix solutions in this manner will essentially restore their original bleaching and fixing capabilities and thereby permit their reuse in photographic processing.

3,700,451

GELABLE AND GELLED COMPOSITIONS

John P. Sullivan, Jr., Malden, Mass., assignor to Itek Corporation, Lexington, Mass.

No Drawing. Filed Apr. 6, 1970, Ser. No. 26,098

Int. Cl. G03c 5/30, 5/26

U.S. Cl. 96—66 10 Claims

Gelable or gelled compositions are disclosed which comprise a liquid medium, agar, and a combination of natural gum gel-forming agents including xanthan gum and locust bean gum. The gelable dispersions are easily gelled by heating to the gel-critical temperature and subsequently cooling them below the setting temperature. In the gelled state, these compositions are useful as carriers for many types of liquids including photoprocessing solutions and therapeutic solutions.

3,700,452

PHOTOSENSITIVE PRINTING-OUT COMPOSITION CONTAINING CHEMICALLY SENSITIZED ORTHO-RHOMBIC CRYSTALLINE Pb(II) OXIDE

Eric Maria Brinckman, Mortsel, Walter August Van den Heuvel, Berchem, Johan Eugeen Van Halst, Wilrijk, and Frans Clement Heugebaert, Kontich, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed Nov. 12, 1969, Ser. No. 876,066

Claims priority, application Great Britain, Nov. 12, 1968, 53,670/68

Int. Cl. G03c 1/00

U.S. Cl. 96—88 24 Claims

A print-out recording material and process using a recording layer containing as the essential photosensitive constituent thereof lead(II) oxide consisting at least 25% by weight of lead(II) oxide in the orthorhombic crystalline form, the lead oxide being dispersed in a hydrophilic water-permeable binding agent.

3,700,453

ANTISTAIN AGENTS COMPRISING MIXTURES OF SECONDARY-ALKYLHYDROQUINONES

William F. Knechel, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Mar. 6, 1970, Ser. No. 17,330

Int. Cl. G03c 1/76

U.S. Cl. 96—74 16 Claims

Mixtures of at least two secondary-alkylhydroquinones in which there are from one to two secondary-alkyl substituents each having from 9 to 20 carbon atoms and,

preferably, mixtures that contain secondary-alkylhydroquinone isomers that are eutectics with low eutectic points, i.e., near or below room temperature, are photographic antistain agents that are superior in chemical and physical properties to antistain agents described in the prior art. Dispersions of the immediate antistain agents in hydrophilic colloids can be held before coating at temperatures below room temperature without crystallizing while antistain agents outside the invention do crystallize.

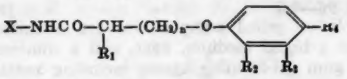
3,700,454

LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING COUPLERS AND COUPLER SOLVENTS

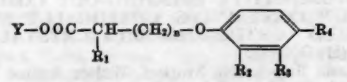
Kenro Sakamoto, 8 Ushinuma, Akita-machi, Nishitamagun; Motoaki Tanaka, 1400 Obwada-cho, Hachioji-shi; Teruo Hanzawa, 32 Ohya-machi, Hachioji-shi; and Keiji Kasai, 127 Oaza-miya, Hino-shi, all of Tokyo, Japan

No Drwing. Filed Aug. 31, 1970, Ser. No. 68,533
Claims priority, application Japan, Sept. 5, 1969, 44/69,946
Int. Cl. G03c *1/40*
U.S. Cl. 96—100 5 Claims

The light sensitive silver halide color photographic material comprises finely divided liquid particles containing at least one coupler which is capable of coupling with the oxidation product of a primary aromatic amine type developing agent, and at least one compound which is a solvent for the coupler. The coupler has the general formula:



wherein X is a coupler residue of the phenolic, pyrazolone or acetanilide type, R_1 is hydrogen or lower alkyl, R_2 and R_4 are individually hydrogen or alkyl (C_1 to C_{18}), R_3 is hydrogen, or alkyl or alkoxy having 4–18 carbon atoms and n is 0 to 3. When R_3 is hydrogen, R_2 and R_4 are alkyl groups and the total sum of the carbon atoms of R_2 and R_4 is 6 to 25. When R_3 is alkyl or alkoxy, R_2 and R_4 are both hydrogen. The solvent has the general formula:



wherein Y is hydrogen or alkyl (C_1 to C_8) and R_1, R_2, R_3, R_4 and n are as defined above. Coupler dispersions having improved stability are obtained.

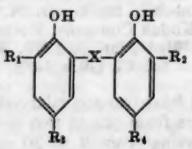
3,700,455

COLOR PHOTOGRAPH CONTAINING FADE-PREVENTING AGENTS

Hidehiko Ishikawa, Mikio Sato, and Syun Takada, Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

No Drawing. Filed Aug. 31, 1970, Ser. No. 68,534
Claims priority, application Japan, Sept. 5, 1969, 44/69,945
Int. Cl. G03c *1/40, 7/00, 1/84*
U.S. Cl. 96—100 4 Claims

A compound of the formula,



wherein R_1, R_2, R_3 and R_4 are individually a straight chain or branched-chain hydrocarbon radical having 1 to 18 carbon atoms, the total sum of carbon atoms of said R_1, R_2, R_3 and R_4 being less than 32; and X is —S—, —O—, $-SO_2$ or

where n is an integer of 0 to 3, and R_5 is a hydrogen atom or a lower alkyl group, and a color image-forming dye are incorporated into a silver halide photographic composition. When developed, a color image having improved light fastness is obtained. An ultraviolet ray absorbing agent and/or a color coupler may be incorporated into the composition.

3,700,456

SYNTHETIC POLYMERIC PHOTOGRAPHIC EMULSION VEHICLES

Donald A. Smith, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 22, 1970, Ser. No. 83,155
Int. Cl. G03c *1/04*
U.S. Cl. 96—114 18 Claims

Photographic silver halide emulsions having a vehicle or binding agent comprising a film-forming addition polymer prepared by polymerization of the monomer or monomers in the presence of a redox catalyst system which contains bromate or chlorate ion as the oxidant. Residual bromate or chlorate ion in the finished polymer does not adversely affect the photographic emulsion.

3,700,457

USE OF DEVELOPMENT INHIBITOR RELEASING COMPOUNDS IN PHOTOTHERMOGRAPHIC ELEMENTS

Mary J. Youngquist, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 9, 1970, Ser. No. 27,151
Int. Cl. G03c *1/02*
U.S. Cl. 96—114.1 15 Claims

A silver halide development inhibitor releasing compound, such as a developing agent or coupler containing a development inhibitor moiety which is releasable upon heating, in a photographic and thermosensitive element suitable for dry processing, provides improved black tone, reduced background print-out, improved image stability, and reduction of exposure and processing time in some cases. A combination of a silver halide development inhibitor releasing compound, such as one containing a heat releasable phenylmercaptotetrazole group, in combination with a stable source of silver for physical developmnet are useful in photographic elements for dry processing. The element can contain a sensitizing dye and a stable developed image can be provided by heating the element after exposure. The photographic component can be photographic silver halide, or other suitable photographic metal salts.

3,700,458

CHEMICAL PROCESS

Robert D. Lindholm, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,955
Int. Cl. G03c *1/02, 1/72*
U.S. Cl. 96—114.1 7 Claims

Noble metal salts of carboxylic acids suitable for use in photosensitive and thermosensitive compositions and elements are prepared by admixing a non-aqueous solution of a noble metal trifluoroacetate or tetrafluoroborate with a non-aqueous solution of a carboxylic acid in the presence of an organic peptizer. Photosensitive and thermosensitive

compositions can be made by admixing a non-aqueous dispersion of a noble metal salt of an organic acid, such as silver behenate, with a suitable organic reducing agent and a catalyst. The compositions can contain addenda suitable in photosensitive and thermosensitive compositions and elements.

3,700,459

SHELLED CORN-COTTONSEED ANIMAL FEED

Ray Joe Riley, Hart, Tex., assignor to John Bridges, Earth, John Gilbreath, Hart, and Lewis Thurman, Earth, Tex., fractional part interest to each

No Drawing. Filed Mar. 13, 1970, Ser. No. 19,481
Int. Cl. A23k *1/00*
U.S. Cl. 99—2 R 12 Claims

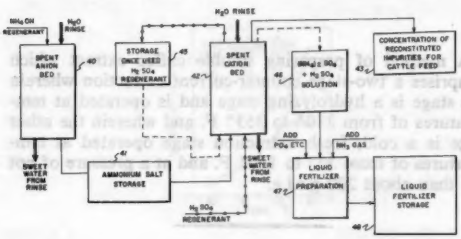
A ration for fattening beef cattle contains only raw, whole, fuzzy cottonseed mixed with raw, whole shelled corn and mineral-vitamin supplements. To start the cattle upon fattening rations, corn silage is mixed with the rations.

3,700,460

ION EXCHANGE TREATMENT OF SUGAR CONTAINING SOLUTIONS AND PRODUCTION OF A LIQUID FERTILIZER

Stanley E. Bichsel and Tim D. Carpenter, Colorado Springs, Colo., assignors to Holly Sugar Corporation, Colorado Springs, Colo.

Filed June 28, 1968, Ser. No. 750,434
Int. Cl. C05c *3/00*
U.S. Cl. 99—2 1 Claim



In the ion exchange treatment of sugar containing liquids, to remove non-sugar impurities, the spent anion resins are regenerated by an aqueous ammonia solution to recover an ammonium salt, as in part through a succeeding water rinse, and the spent cation resins are contacted with the ammonium salt solution to reconstitute the impurities, including betaine and amino acids, for use on beet pulp as a food for cattle. The cation resins are thus regenerated to the ammonium form and are converted to the hydrogen form by aqueous sulfuric acid, which forms ammonium sulfate for use in a liquid fertilizer. The initial portion of the aqueous sulfuric acid regenerant is once used acid, thus reducing the cost of acid regeneration. The nitrogen content of the ammonium sulfate solution is increased by the addition of ammonia, while other water soluble fertilizer chemicals, such as phosphate and potassium, may be added, to produce a more commercially acceptable liquid fertilizer.

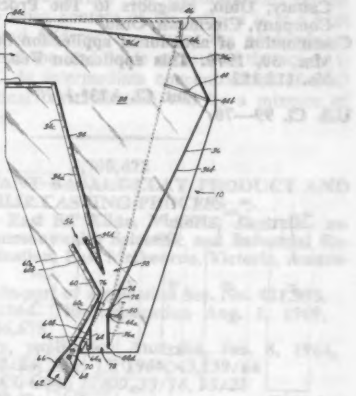
3,700,461

GAS SUSPERSION AGGLOMERATION

Alvin J. Dickens, Jr., Chapel Hill, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Apr. 7, 1970, Ser. No. 26,204
Int. Cl. A23c *9/00*; A23g *7/00*
U.S. Cl. 99—26 12 Claims

An agglomerator for agglomerating fine particles of matter such as water wettable food particles and/or food additives, including an agglomeration chamber having a greater cross-sectional area in its upper portion than in its lower portion and having adjustably movable walls for controlling the size of the agglomerated product. Material to be agglomerated is supplied to an entrance zone at the base of the chamber where it is wetted and then suspended in a gaseous (air) medium in the chamber. An adjustable baffle at the entrance zone controls



the flow of the wetting or active agglomerating agent and the gaseous medium. The particles are caused to agglomerate to a size sufficient to overcome the buoyant force of the gaseous medium flowing through the chamber and then to be discharged therefrom adjacent the entrance zone, while the gaseous medium leaves the chamber through an exhaust zone at the upper portion of the chamber.

3,700,462

BALANCED COFFEE FLAVORS

Arthur Stefanucci, 119 Merrill Road, Clifton, N.J. 07011, and Slawko Yadlowsky, 308 N. 13th Ave., Manville, N.J. 08835

No Drawing. Filed July 27, 1970, Ser. No. 58,689
Int. Cl. A23f *1/02*
U.S. Cl. 99—68 21 Claims

Single varieties of coffee are divided into portions and each portion roasted to a separate and discernible average roasted color, the portions are combined and provide, on infusion, improved flavor characteristics compared to the same variety roasted to its optimum color. Blends of varieties of coffee are similarly treated. The above roasts are blended with roasted low grade coffee and mask the undesirable flavor characteristics of the low grade coffee.

3,700,463

COFFEE EXTRACTION PROCESS

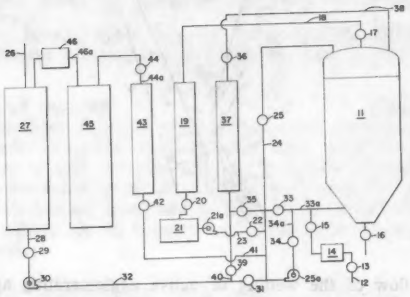
Gregory L. Bolt and Rudolf G. K. Strobel, Colerain Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Oct. 2, 1970, Ser. No. 77,755
Int. Cl. A23f *1/08*
U.S. Cl. 99—71 8 Claims

A method of producing a soluble coffee extract wherein the flavor balance of brew-likeness, strength, acidity, and aromatic notes are controlled in the fresh extraction column of a multi-column extraction train. The combination of pressures, temperatures, and cycle times of 5 p.s.i.a.–35 p.s.i.a., 160° F.–260° F., and 5–45 minutes, respectively, are used in the fresh extraction column to obtain a desirable balance of flavor components. The temperatures

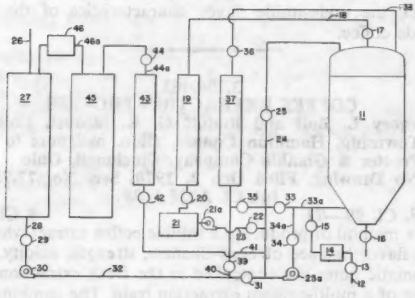
and pressures utilized result in a vapor phase in the fresh extraction column which in turn is responsible for the improved product of this invention.

3,700,464
DECAFFEINATION PROCESS
Jayantilal M. Patel, Reading and Alan B. Wolfson and Benjamin Lawrence, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of abandoned application Ser. No. 23,647, Mar. 30, 1970. This application Feb. 23, 1971, Ser. No. 118,182
Int. Cl. A23f 1/10
U.S. Cl. 99—70 6 Claims



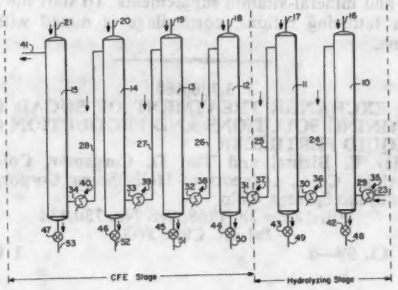
Decaffeination total process times and caffeine extraction times are substantially reduced by utilizing high caffeine extracting temperatures and high pre-wetting moisture ranges.

3,700,465
NONVACUUM DRYING OF DECAFFEINATED GREEN COFFEE BEANS
Benjamin Lawrence and Alan B. Wolfson, Springfield Township, Hamilton County, and Jayantilal M. Patel, Reading, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of abandoned application Ser. No. 23,648, Mar. 30, 1970. This application Feb. 23, 1971, Ser. No. 118,185
Int. Cl. A23f 1/10
U.S. Cl. 99—70 4 Claims



Drying times for decaffeinated green coffee beans are substantially reduced by drying green coffee beans in a nonvacuum dryer at bean surface temperatures of from 220° F. to 300° for from 15 minutes to 60 minutes.

3,700,466
METHOD OF MAKING COFFEE EXTRACT
Robert J. Bergeron, Springfield Township, Hamilton County, and Stephen L. Schlichter, Green Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of abandoned application Ser. No. 779,711, Nov. 29, 1968. This application Mar. 15, 1971, Ser. No. 124,454
Int. Cl. A23f 1/08
U.S. Cl. 99—71 9 Claims



A method of preparing soluble coffee extract which comprises a two-stage counter-current extraction wherein one stage is a hydrolyzing stage and is operated at temperatures of from 330° to 355° F. and wherein the other stage is a cold, fresh extraction stage operated at temperatures of from 32° to 180° F. and at a pressure of not less than about 200 p.s.i.g.

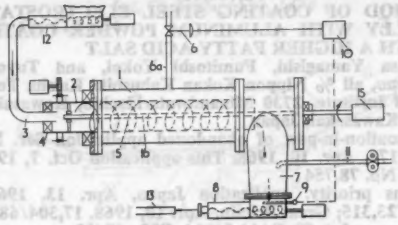
3,700,467
MUSHROOM PUFFS
Thomas Di Cecco, Toughkenamon, Pa.
(P.O. Box 370, Avondale, Pa. 19311)
Filed Sept. 9, 1970, Ser. No. 70,767
Int. Cl. A23b 7/02
U.S. Cl. 99—104 7 Claims

An edible mushroom product having a puffed structure, a relatively high protein content; free of cholesterol and having a unique and exotic flavor. The product is produced by comminuting mushrooms, mixing the same with flour, and, by a process of steaming, water spraying, cooking, extruding through a suitable die, and cutting into desired lengths, is formed into short sticks or biscuits.

3,700,468
STERILIZING SEPARATE COMPARTMENTS OF PARTICULATE MATERIAL
David Teignmouth Shore, Banstead, and Granville Lewis Starkie, Crawley, England, assignors to The A.P.V. Company Limited, Crawley, England
Filed May 27, 1970, Ser. No. 40,806
Claims priority, application Great Britain, May 28, 1969, 27,009/69
Int. Cl. A23b 1/04
U.S. Cl. 99—216 3 Claims

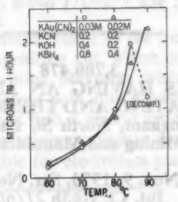
The specification discloses a method and apparatus for sterilizing particulate solid material such as meat cubes or beans. The particles of solid material are positively fed by a conveyor, such as a screw conveyor, through a

chamber with an atmosphere of steam or other heating gas, and the residence time determined by the positive



feeding is such as to ensure that the required treatment in the chamber is completed.

3,700,469
ELECTROLESS GOLD PLATING BATHS
Yutaka Okinaka, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Continuation of abandoned application Ser. No. 872,610, Oct. 30, 1969. This application Mar. 8, 1971, Ser. No. 122,103
Int. Cl. C23c *3/02*
U.S. Cl. 106—1 **5 Claims**



Conditions and bath compositions are given for electroless plating of pure gold and gold alloys on a variety of substrates including ones with gold surfaces. The plating bath contains a gold cyanide complex, and free cyanide is added to stabilize this complex. A borohydride or aliphatic-substituted amine borane is used as the reducing agent and the pH is adjusted by the addition of an alkaline agent. The resulting bath is stable, yields plating rates of typically 0.5 to 3 microns per hour at about 75° C. and plating thickness up to a micron or greater.

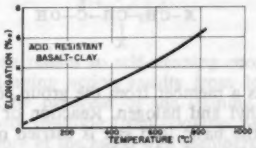
3,700,470
FOAMED CERAMIC MATERIAL AND METHOD OF MAKING THE SAME
Patrick William Barton, Elanora Heights, New South Wales, Australia, assignor to A.C.I. Operations Pty. Limited, Melbourne, Victoria, Australia
No Drawing. Filed Aug. 31, 1970, Ser. No. 68,556
Claims priority, application Australia, Sept. 2, 1969, 60,332/69
Int. Cl. B29d *27/04*; C04b *37/10*
U.S. Cl. 106—75 **10 Claims**

Lightweight foamed solid shapes, e.g. building panels are made by mixing a ceramic filler, a powdered amphoteric metal, preferably aluminum, and aqueous sodium silicate, shaping the mix and subsequently curing it with or without facing sheets. Use of waste ceramic materials, especially power station fly ash, is preferred.

3,700,471
GLASS-CERAMIC ARTICLES
David A. Duke, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
No Drawing. Filed Nov. 12, 1970, Ser. No. 89,111
Int. Cl. C03c *3/22, 3/10*; C04c *35/00*
U.S. Cl. 106—39 DV **1 Claim**

This invention relates to the manufacture of glass-ceramic articles in the PbO-Al_2O_3-SiO_2 composition field utilizing TiO_2 and/or ZrO_2 plus P_2O_5 as nucleating agents. Alpha-cristobalite comprises the predominant crystal phase when the silica content of the articles is at a high level whereas lead feldspar constitutes the predominant crystal phase when the lead oxide content of the article is at a high level. At intermediate concentrations of PbO and SiO_2, the final crystallization will be a mixture of these two phases.

3,700,472
ACID RESISTANT BASALT-CLAY PRODUCT AND SLIP CASTING PROCESS
Elisha Tauber, East St. Kilda, Victoria, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, East Melbourne, Victoria, Australia
Continuation-in-part of application Ser. No. 421,998, Dec. 29, 1964. This application Aug. 1, 1969, Ser. No. 846,675
Claims priority, application Australia, Jan. 8, 1964, 39,557/64; Apr. 13, 1964, 43,139/64
Int. Cl. C04b *29/00, 33/18, 33/28*
U.S. Cl. 106—39 R **7 Claims**



Ceramic articles are prepared by mixing igneous rock particles, preferably basalt particles ranging in size from about 3 mesh to 200 mesh with slip-casting clay and water, slip casting the mixture and then firing the cast product at a temperature in the range of about 950° C. to about 1200° C. By varying the firing temperature, different ceramic products are produced. At a firing temperature of about 950° to 1150° C., a sintered heterogeneous product is obtained which is useful for building and ornamental purposes. The ceramic obtained by firing the cast product at about 1160 to 1200° C. is a substantially homogeneous material related to stoneware and characterized by a high degree of acid resistance as well as resistance to abrasion and to heat shock.

3,700,473
PROCESS FOR TREATING REINFORCING SILICA FILLER
John S. Razzano, Troy, and Alfred H. Smith, Jonesville, N.Y., assignors to General Electric Company
No Drawing. Filed Nov. 4, 1970, Ser. No. 86,972
Int. Cl. C08h *17/04*
U.S. Cl. 106—288 Q **9 Claims**

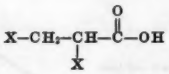
The process for treating reinforcing silica filler so as to render it non-structuring when it is mixed with convertible polyorganosiloxane comprising contacting at a temperature in the range of 50° to 300° C. finely divided silica having a surface area of at least 50 square meters per gram and containing at least 0.2 weight percent absorbed water with a fluorine-substituted aliphatic acid. At the same time, prior or after the fluorine-substituted aliphatic acid is brought into contact with the silica filler, the filler is also contacted with a cyclopolyorganosiloxane.

3,700,474
INCREASE IN CLAY RESPONSIVENESS TO WETTING
William J. Lang, Libertyville, Ill., assignor to International Minerals & Chemical Corporation
No Drawing. Filed Dec. 9, 1970, Ser. No. 96,601
Int. Cl. C09c 1/42
U.S. Cl. 106—288 B 14 Claims

A method for treating a platey-type clay, namely, a clay such as bentonite having a micaceous sheet structure, to make it more readily slakable in water, which comprises compacting fine particles of the clay, having a maximum moisture content of about 20% by weight of water, into sheet form, and crushing the clay sheet thus formed.

3,700,475
METHOD OF PRODUCING A PEARLESCENT BASIC LEAD CARBONATE PIGMENT
David R. Meldrum, Englishtown, N.J., assignor to Cities Service Company, New York, N.Y.
No Drawing. Filed Dec. 11, 1970, Ser. No. 97,352
Int. Cl. C09c 1/14
U.S. Cl. 106—291 18 Claims

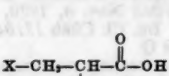
A pearlescent pigment consisting of hexagonal platelets of basic lead carbonate is produced by bubbling carbon dioxide gas into an aqueous solution of a basic lead salt which is derived from the reaction of lead monoxide with an acid. The acid that is reacted with the lead monoxide can be nitric acid, but more preferably will have the formula:



wherein X is a member from the group consisting of hydrogen, methyl and halogen. Reaction of the carbon dioxide with the basic lead salt is carried out in the presence of a ketone dissolved in the aqueous reaction medium, thus facilitating control over the rate and extent of crystal initiation and growth. The resulting basic lead carbonate pigment can be incorporated into plastics, lacquers, and the like to provide articles having the appearance of natural pearl.

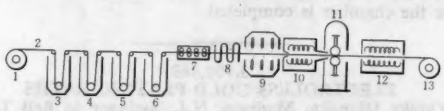
3,700,476
METHOD OF PRODUCING PEARLESCENT BASIC LEAD CARBONATE PIGMENT
David R. Meldrum, Englishtown, N.J., assignor to Cities Service Company, New York, N.Y.
No Drawing. Filed Dec. 11, 1970, Ser. No. 97,353
Int. Cl. C09c 1/14
U.S. Cl. 106—291 18 Claims

A pearlescent pigment consisting of hexagonal platelets of basic lead carbonate is produced by bubbling carbon dioxide gas into an aqueous solution of a basic lead salt which is derived from the reaction of lead monoxide with an acid. The acid that is reacted with the lead monoxide can be nitric acid, but more preferably will have the general formula:



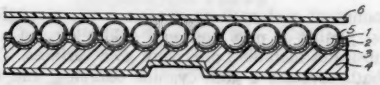
wherein X is a member from the group consisting of hydrogen, methyl and halogen. Reaction of the carbon dioxide with the basic lead salt is carried out in the presence of an alcohol dissolved in the aqeuous reaction medium, thus facilitating control over the rate and extent of crystal initiation and growth. The resulting basic lead carbonate pigment can be incorporated into plastics, lacquers, and the like to provide articles having the appearance of natural pearl.

3,700,477
METHOD OF COATING STEEL ELECTROSTATICALLY WITH ALUMINUM POWDER COATED WITH A HIGHER FATTY-ACID SALT
Hidehisa Yamagishi, Fumitoshi Yokoi, and Tuyoshi Kutino, all % Nippon Kokan Kabushiki Kaisha Technical Institute, 2730 Minamiwataridachio, Kawasakaishi, Kawasakai, Japan
Continuation-in-part of abandoned application Ser. No. 720,178, Apr. 10, 1968. This application Oct. 7, 1970, Ser. No. 78,754
Claims priority, application Japan, Apr. 13, 1967, 42/23,315; Great Britain, Apr. 10, 1968, 17,304/68
Int. Cl. B44d 1/094; C23c 17/02
U.S. Cl. 117—17 7 Claims



A steel surface is coated electrostatically with aluminum powder which is coated with a sodium, calcium or zinc salt of a saturated higher fatty acid having from about 16 to 18 carbon atoms. The coated steel surface is then heated, rolled and heated.

3,700,478
MICROSPHERES HAVING AN ANTIREFLECTION COATING AND THEIR USE
Wallace Karl Bingham, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Nov. 9, 1970, Ser. No. 87,858
Int. Cl. G03b 21/60
U.S. Cl. 117—28 4 Claims

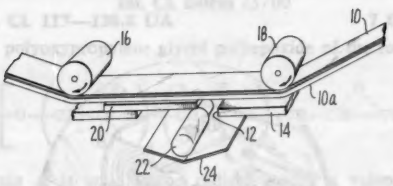


Retroreflective sheet constructions containing high index glass microspheres, which microspheres contain an antireflection coating thereon.

3,700,479
METHOD OF PROVIDING A LUMINESCENT LAYER ON A SUPPORT
Johannes Wilhelmus Maria Arents, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
No Drawing. Filed Oct. 6, 1969, Ser. No. 864,223
Claims priority, application Netherlands, Oct. 7, 1968, 6814348
Int. Cl. H01j 1/62
U.S. Cl. 117—33.5 L 9 Claims

A suspension medium for a mixture of a fine-grained luminescent material and a fine-grained non-luminescent solid material containing a temporary binder, an organic non-polar non-aromatic liquid and an organic polar organic non-aromatic liquid, both liquids being solvents for the temporary binder.

3,700,480
VESICULAR FILM
Robert H. Murashige, Los Altos, Calif., assignor to Memorex Corporation, Santa Clara, Calif.
Filed Jan. 6, 1971, Ser. No. 104,290
Int. Cl. G03c 1/52, 1/74
U.S. Cl. 117—34 2 Claims



A method of making vesicular film comprising drying a solution of a diazonium salt and polyvinyl formal onto a subcoated translucent substrate, and uniformly preexposing the uncoated base side of the substrate to a controlled light source to decompose diazonium compounds which have intruded into or near the subcoating whereby blistering of the subcoat is prevented.

3,700,481
ELECTROLESSLY PLATABLE POLYMERIC BLENDS
James Chin and Harry S. Witt, Naugatuck, and Eli Schwartz, New Haven, Conn., assignors to Uniroyal, Inc., New York, N.Y.
No Drawing. Filed Aug. 23, 1968, Ser. No. 754,948
Int. Cl. B44d 1/092; C23c 3/02
U.S. Cl. 117—47 A 7 Claims

The present invention relates to the incorporation of an electroless metal depositing aid, which consists of various basic nitrogen-containing polymers wherein the nitrogen has an available electron pair, into a polymeric matrix capable of being formed into a plastic article with the result that the nitrogen-containing polymer renders the surface of such article suitable for electroless plating.

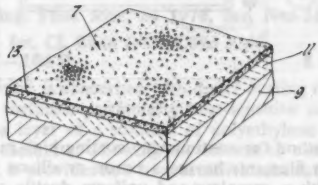
3,700,482
URANIUM SURFACE PREPARATION FOR ELECTROLESS NICKEL PLATING
Germaine F. Jacky, Portland, Oreg., and Richard D. Ehrlich, Oakland, Calif., assignors to the United States of America as represented by the United States Atomic Energy Commission
No Drawing. Filed Dec. 1, 1970, Ser. No. 94,162
Int. Cl. C23c 3/00
U.S. Cl. 117—50 3 Claims

The quality of nickel plating applied to uranium bodies by the electroless plating process is substantially improved if, after degreasing, pickling and etching, the uranium bodies are treated with a saturated solution of palladium chloride or a hot solution of tetrasodium pyrophosphate and rinsed before immersion in the electroless nickel plating solution.

3,700,483
PROCESS FOR THE PRODUCTION OF SHEET-FORM BACKING MATERIALS COATED WITH FUSED SYNTHETIC RESINS
Erich Gentsch, Klaus Bederke, and Walter Seider, Wuppertal-Barmen, Hans Jurgen Fullner, Wuppertal-Langerfeld, and Christa Muhlmann, Wuppertal-Barmen, Germany, assignors to Dr. Kurt Herberts & Co. vormals Otto Louis Herberts, Wuppertal-Barmen, Germany
No Drawing. Filed Dec. 11, 1970, Ser. No. 97,316
Claims priority, application Germany, Dec. 12, 1969, P 19 62 407.8
Int. Cl. B44d 1/44
U.S. Cl. 117—65.2 12 Claims

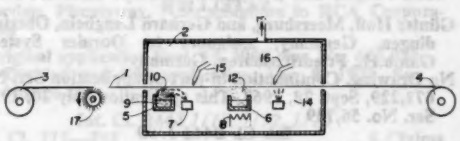
There is provided a process for the production of sheet-form substrates coated with fused, catalyst-containing thermosetting synthetic resins, comprising fusing the catalyst-containing thermosetting resin mixture at a temperature of from 70 to 100° C., applying the fused resin in the form of a melt to one side of the substrate and heating the resin-coated substrate at an elevated temperature up to 200° C. and at an elevated pressure up to 15 kp./cm.² to effect a cure of the resin. The process enables economic production of high-grade plastic coated surfaces with good intermediate storage and molding properties.

3,700,484
METHOD FOR MAKING THE ENCLOSURE WALLS OF A LOW TEMPERATURE SELF-CLEANING COOKING DEVICE
Victor A. Williamitis, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 23, 1970, Ser. No. 21,883
Int. Cl. B44d 1/16
U.S. Cl. 117—70 A 3 Claims



This invention relates to self-cleaning cooking devices wherein the cleaning action results from low temperature, non-catalytic pyrolysis of the staining spatter and condensed vapors resulting from cooking. More particularly, one or more of the metal wall members defining the cooking enclosure are formed with a glazed porcelain enamel undercoating on which an unglazed porcelain enamel-forming coating is provided by underfiring a porcelain enamel-forming slurry containing an extra loading of pulverized granular materials having sharply angular surfaces selected from the group of non-catalytic refractory or abrasive materials comprising alumina, silica, emery, tungsten carbide, silicon carbide, kaolin, and feldspar in an amount of from about 20–30% by weight of the frit materials in the slurry.

3,700,485
VACUUM VAPOR DEPOSITED ZINC COATINGS
Robert G. Rubin, Pittsburgh, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Continuation-in-part of application Ser. No. 682,354, Nov. 13, 1967. This application Apr. 10, 1970, Ser. No. 27,416
Int. Cl. B44d 1/16
U.S. Cl. 117—71 M 9 Claims



Adherent vacuum vapor deposited zinc coatings are provided ferrous substrates by initially vacuum vapor coat-

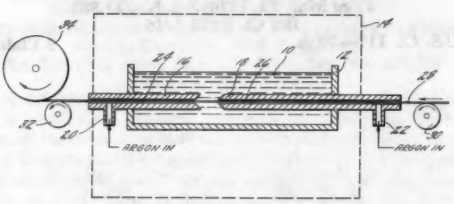
ing the substrates with a first metal comprising either aluminum or magnesium and thereafter vacuum vapor coating the substrates with zinc. The temperature of a substrate during the coating procedure and the elapsed time between application of the successive coatings are controlled within critical limits.

3,700,486

METHOD FOR COATING FILAMENTS

Richard D. Veltri and Asaph U. Merriam, East Hartford, and Malcolm Basche, West Hartford, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 31, 1970, Ser. No. 103,208
Int. Cl. C23c *1/08, 1/10*
U.S. Cl. 117—71 R 4 Claims



A method for continuously coating high modulus, high strength filaments having a boron or silicon carbide surface with a complete and uniform ductile metal matrix overcoat of aluminum or magnesium comprising passing the filament through a pair of axially aligned tubular conduits having matable end portions immersed in a molten bath of the metal matrix material, the end portions being initially conjoined to prevent contact of the filament with the molten metal, and separating the conduit end portions a distance sufficient to expose the moving filament to the molten metal and cause uniform coating thereof.

3,700,487

POLYCARBONATE SUBSTRATE WITH DURABLE, ABRASION AND SCRATCH-RESISTANT, ANTI-FOGGING COATING

Harry D. Crandon, Woodstock, Conn., and Albert R. Le Boeuf, Sturbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

No Drawing. Filed Feb. 23, 1971, Ser. No. 118,092
Int. Cl. G02c *7/02*; B32b *27/06*
U.S. Cl. 117—72 1 Claim

At least one surface of a substrate, initially prepared to provide adequate bonding, is coated with a polyvinyl alcohol that has been lightly crosslinked to provide a permanent, abrasion-resistant antifog coating on the surface.

3,700,488

SATELLITE

Günter Hoff, Meersburg, and Gerhard Langbein, Oberuhldingen, Germany, assignors to Dornier Systems G.m.b.H., Friedrichshafen, Germany

No Drawing. Continuation-in-part of application Ser. No. 671,229, Sept. 28, 1967. This application July 20, 1970, Ser. No. 56,729
Int. Cl. B44d *1/00*
U.S. Cl. 117—94 5 Claims

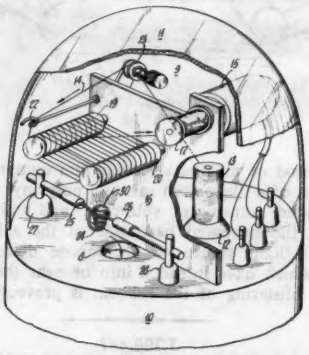
This invention relates to a satellite having a covering on at least a portion of the exterior thereof of a material having low sound wave resistance, good adsorptive power, and high absorption of energy resulting from the impact of gas molecules upon the satellite at high speed.

3,700,489

PROCESS FOR APPLYING A THIN COATING OF POLYTETRAFLUOROETHYLENE

Emil Borysko, Somerville, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed July 30, 1970, Ser. No. 59,415
Int. Cl. B44d *1/02*
U.S. Cl. 117—106 R 9 Claims



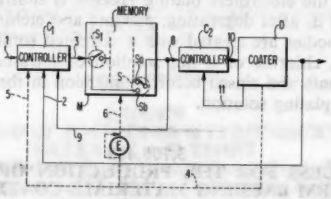
Polytetrafluoroethylene is condensed on the surface of a textile filament by heating the polytetrafluoroethylene in a vacuum to form the vapor phase and passing the filament through the vapor so obtained while rotating the filament on its axis. Surgical needles may be similarly coated by condensing polytetrafluoroethylene from the vapor phase.

3,700,490

METHOD OF COATING BY DELAYING THE CONTROL SIGNAL FOR OPERATING THE COATING APPARATUS

Hirosi Hiyosi and Masao Kanda, Shizuoka, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Claims priority, application Japan, Dec. 23, 1969, 44/103,656
Filed Dec. 23, 1970, Ser. No. 100,940
Int. Cl. G05b *13/02*
U.S. Cl. 117—120 2 Claims



Upon sensing an abnormal coating condition, a memory automatically transmits a control signal representing normal coating conditions to the controller controlling coating operation and prevents the controller from receiving signals from the memory corresponding to abnormal coating conditions until such abnormal coating condition ceases.

3,700,491

COATED SYNTHETIC ORGANIC POLYMER FIBER

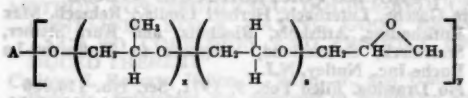
Karl Altau, Waynesboro, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 8, 1970, Ser. No. 26,771

Int. Cl. D06m *15/00*

U.S. Cl. 117—138.8 UA 7 Claims

A polyoxypropylene glycol polyepoxide of the formula



wherein A is an alkylene radical having a valence of Y and may contain at least one hydroxyl substituent, X is an integer from 4 to 60, inclusive, Z is an integer from 0 to 40, inclusive, Y is an integer of at least 2, and the ratio of X to Z is greater than about 3 to 2 and a composition comprising at least one polyepoxide of the above formula and at least one other polyepoxide formed as a reaction product of epichlorhydrin and a polyhydroxy compound containing at least three hydroxyl groups are prepared. They are suitable for minimizing the accumulation of charge of static electricity on a synthetic shaped structure. They also cause the shaped structure to attract fluorescent whitening agents from detergent solutions, are fast to bleaching, and do not cause staining during dry cleaning.

3,700,492

COATED SUBSTRATE

Joseph G. Bergomi, Jr., St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Jan. 5, 1971, Ser. No. 104,170

Int. Cl. D21h *1/28*

U.S. Cl. 117—155 UA 10 Claims

Coated substrate comprising a fibrous substrate having a coating thereon comprising a mineral pigment and a polyblend of ethylene/vinyl chloride/acrylamide interpolymer and polyacrylamide.

3,700,493

CELLULOSIC PRODUCTS TREATED WITH IMPROVED QUATERNARY AMMONIUM ELECTROCONDUCTIVE ADDITIVES FROM VINYL-AROMATIC POLYMERS

Lawrence F. Sonnabend, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of abandoned application Ser. No. 78,639, Oct. 6, 1970, which is a division of application Ser. No. 773,309, Nov. 4, 1969, now Patent No. 3,607,989. This application June 16, 1971, Ser. No. 153,889

Int. Cl. B44d *1/18;* C08f *27/03*

U.S. Cl. 117—201 7 Claims

Electroconductive cellulosic products with improved color and color stability are obtained by treating a base cellulosic product with a quaternary ammonium additive prepared by chloromethylation and amination of an essentially linear vinylaromatic polymer containing less than 0.3 weight percent residual ethylenic unsaturation. The treated products have improved stability as shown by retention of surface brightness and decreased yellowing. They are particularly useful in preparing reprographic printing paper.

3,700,494

BRIGHT-FINISH WELDING WIRE

Samuel C. Avallone, Westlake, Ohio, assignor to United States Steel Corporation

No Drawing. Original application Jan. 29, 1970, Ser. No. 6,929, now Patent No. 3,563,074, dated Jan. 16, 1971. Divided and this application Sept. 16, 1970, Ser. No. 72,840

Int. Cl. B23k *35/22;* C23f *7/26*

U.S. Cl. 117—202 3 Claims

Article of the invention is a bright-finish weld-wire for electric welding purposes having a low hydrogen level and an extended shelf life.

3,700,495

PROCESS FOR COATING SUBSTRATES WITH POLYETHYLENE AND PRODUCTS PRODUCED THEREBY

Jurgen M. Kruse, Lincoln, and John E. Wyman, Lexington, Mass., assignors to Itek Corporation, Lexington, Mass.

No Drawing. Filed Mar. 30 1970, Ser. No. 31,029

Int. Cl. B44d *1/08;* C09d *3/60*

U.S. Cl. 117—104 R 8 Claims

This invention is concerned with direct coating of polyethylene on surfaces, particularly heat-sensitive surfaces, by forming a layer of a solution of polyethylene on the surface and thereafter allowing the solvent to evaporate. Additionally, it provides new heat sensitive substrates with polyethylene coatings directly bonded to the surface of the substrate.

3,700,496

APPLICATION OF METAL COATINGS BY THE SEIZURE METHOD

Emile Plumat, Gilly, Belgium, assignor to Glaverbel S.A., Brussels, Belgium

Filed Apr. 29, 1970, Ser. No. 32,967

Claims priority, application Luxembourg, May 2, 1969, 58,564; Great Britain, Mar. 26, 1970, 14,891/70

Int. Cl. C23c *17/00;* H05b *3/12*

U.S. Cl. 117—211 14 Claims

Metal coatings are applied to article surfaces by frictional contact between the surface and a scriber of the metal to be deposited, the metal being a special alloy of aluminum and at least 0.1% by weight of at least one secondary metal giving the alloy a Brinell hardness of not more than 100.

3,700,497

METHOD OF MAKING A SEMICONDUCTOR DEVICE INCLUDING A POLYIMIDE RESIST FILM

Robert Nicholas Epifano, Oceanport, and Eugene Leon Jordan, Piscataway, N.J., assignors to RCA Corporation

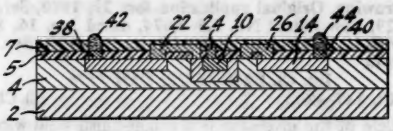
Original application Sept. 15, 1967, Ser. No. 668,080. Divided and this application Apr. 8, 1970, Ser. No. 26,806

Int. Cl. B44d *1/18, 1/52, 1/10*

U.S. Cl. 117—212 6 Claims

Method of manufacturing a semiconductor device or integrated circuit which includes using a masking film composed of a thermoplastic type polyimide synthetic resin. The resin film is deposited either directly on the semiconductor body or on a passivating film of a substance such as silicon dioxide or silicon nitride, while the

resin is in an incompletely cured (incompletely polymerized) state. Openings are etched through the film while it is in this state. Then the film is completely cured. After the



resin film is completely cured it may be subjected to relatively high temperatures and to most solvents, as may be required in later device processing steps, without damage to the resin film.

3,700,498

PROCESS FOR MAKING ELECTROPHOTOGRAPHIC PLATES

Kay Keiji Kanazawa, Hajime Seki, and George Bryan Street, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

No Drawing. Filed Dec. 10, 1970, Ser. No. 97,052
Int. Cl. B44d *1/34, 1/42*; C23c *11/00*
U.S. Cl. 117—230 **4 Claims**

Electrophotographic plates are formed by depositing a layer of beta phase polycrystalline As_4S_4 by evaporation under vacuum onto an electrically conductive substrate held at a temperature between 100° C. and 200° C.

3,700,499

MAGNETIC RECORDING ELEMENT

Gottfried C. Haack, Stamford, and Lindley Clair Beegle, Darien, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed June 17, 1969, Ser. No. 834,160
Int. Cl. H01f *10/02*
U.S. Cl. 117—235 **2 Claims**

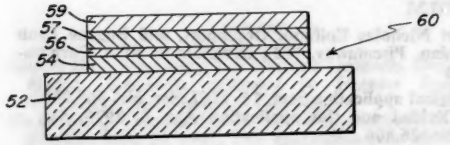
A magnetic recording element comprising a support having thereon a recording film of particulate material consisting essentially of magnetic particles having an iron core with an layer of iron nitride, Fe_4N, coating.

3,700,500

MAGNETIC FILMS HAVING A PREDETERMINED COERCIVITY

Donald Stanley Rodbell, Burnt Hills, and James M. Lommel, Schenectady, N.Y., assignors to General Electric Company

Filed Dec. 4, 1967, Ser. No. 687,822
Int. Cl. H01f *10/06*
U.S. Cl. 117—239 **2 Claims**



Magnetic films having a predetermined coercivity are formed by disposing a vacuum deposited, polycrystalline thin magnetic film of iron, cobalt or nickel in an oxygen bearing atmosphere and subsequently annealing the magnetic film at a temperature between 50° C. and 600° C. for a sufficient period, e.g. between 10 to 300 minutes, to increase the coercivity of the magnetic film to a desired value within a fixed range. In a specific instance, a monotonic increase from 38.4 oersteds to 530 oersteds was observed in the coercive force of 300 A. thick iron film upon a glass substrate when annealed for 130 minutes at a pressure of 5×10^{-5} torr. Annealing of the magnetic films generally was found to produce only a fractional decrease in the magnetization of the films.

3,700,501

PROCESS FOR PRODUCING XYLOSE

Urs Gasche, Luterbach, Herbert Lindlar, Reinach, Max Rutishauser, Attisholz, Riedholz, and Kurt Steiner, Starrkirch, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Feb. 9, 1971, Ser. No. 114,060
Claims priority, application Switzerland, Feb. 20, 1970, 2,442/70
Int. Cl. C13k *9/00*
U.S. Cl. 127—43 **21 Claims**

A process for producing xylose from a powder obtained from sulfite waste liquors by treating the powder with a mixture of an organic solvent having strong extraction properties, an organic solvent having weak extraction properties, and 0.5–2.5 percent by volume water.

3,700,502

HIGH ENERGY DENSITY BATTERY

Nobuatsu Watanabe, Kyoto, and Masataro Fukoda, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of abandoned application Ser. No. 814,015, Apr. 7, 1969. This application Apr. 21, 1971, Ser. No. 136,247
Claims priority, application Japan, Apr. 17, 1968, 43/26,218
Int. Cl. H01m *17/00*
U.S. Cl. 136—6 **6 Claims**

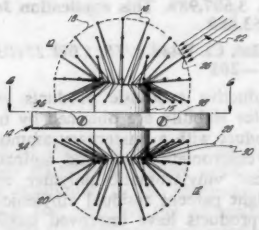
A battery of high energy density which is composed of a negative electrode consisting mainly of a light metal, a non-aqueous electrolyte and a positive electrode having a solid fluorinated carbon as active material, said solid fluorinated carbon being obtained by the fluorination of an amorphous carbon, such as charcoal, active carbon or coke; and which has such advantages that the utility of the positive electrode active material is high, that the flat characteristic of discharge voltage is excellent, that the shelf life is long due to the chemical stability in the electrolyte of the fluorinated carbon used as active material, and that the cost is low.

3,700,503

IRRADIANCE MEASURING DEVICE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Eric G. Laue, San Marino, Calif.

Filed June 9, 1971, Ser. No. 151,413
Int. Cl. H01v *1/02*
U.S. Cl. 136—224 **8 Claims**



A thermopile configured to resemble a pin cushion for enabling direct measurements of incident radiant energy,

is disclosed. The thermopile includes a plurality of serially connected hemispherical arrays. A clamping shield separates the respective arrays. One thermocouple array is employed as a sensor to detect incident radiant energy while the other array serves as a thermal reference and is maintained at a reference temperature. Electrical signals developed across a pair of output terminals provide a quantitative indication of incident radiant energy.

3,700,504

METHOD FOR PRODUCING DOUBLE-REDUCED CONTAINER STOCK HAVING GOOD RESISTANCE TO CORROSION AND PRODUCT PRODUCED THEREBY

Carlton E. Roberts, Hilton N. Rahn, Jr., and Walter E. Reid, Jr., Bethlehem, Pa., assignors to Bethlehem Steel Corporation

No Drawing. Continuation of abandoned application Ser. No. 689,000, Dec. 8, 1967. This application Dec. 21, 1970, Ser. No. 100,547

Int. Cl. C21d 7/14

U.S. Cl. 148—2 6 Claims

A method for producing double-reduced container stock including providing steel containing not more than .03% carbon, about 0.25% to about 0.60% manganese, about .014% to about .025% sulfur and not more than about 0.20% copper with a range of about .06% to about .20% copper preferred. A weight ratio of not less than 12 manganese to one carbon is maintained in the steel. The steel is poured into ingot molds, slabbed, hot rolled to coil form, cold rolled to an intermediate gage, annealed and double-reduced cold to a light base weight. Container stock so prepared has a corrosion resistance of not more than 60 microamperes per square centimeter when tested by a phosphoric acid-blue dye test (PABD), and sufficient strength to be processed into containers suitable for containing highly corrosive foods, carbonate beverages and the like.

3,700,505

COATING FERROUS BASE METAL ARTICLES

Jerome J. Kanter, 12300 Hobart Ave., Palos Park, Ill. 60464

No Drawing. Continuation-in-part of abandoned application Ser. No. 828,707, May 28, 1969. This application Jan. 11, 1971, Ser. No. 105,650

Int. Cl. C23c 17/00

U.S. Cl. 148—6.35 26 Claims

Iron, steel, and iron base alloys are provided with coatings made by forming an adherent oxide layer on the surface, treating the oxide layer with at least one Group III metal, and then oxidizing the Group III metal. The coatings are useful for providing corrosion and oxidation resistance, particularly at elevated temperatures. The coatings also are useful for providing an electrically insulative or dielectric layer.

3,700,506

METHOD FOR REDUCING AN IRON LOSS OF AN ORIENTED MAGNETIC STEEL SHEET HAVING A HIGH MAGNETIC INDUCTION

Osamu Tanaka and Fumio Matsumoto, Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

No Drawing. Filed Dec. 9, 1969, Ser. No. 883,614

Claims priority, application Japan, Dec. 10, 1968, 43/90,427

Int. Cl. H01f 1/18

U.S. Cl. 148—111 2 Claims

A process for reducing an iron loss of an oriented magnetic steel sheet having a high magnetic induction by subjecting a decarburizing annealing, thereupon coating the thus annealed steel sheet with an annealing separator, to which B and S or Se are added, and then finally annealing the steel sheet.

3,700,507

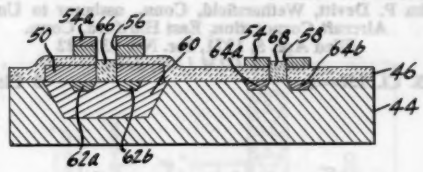
METHOD OF MAKING COMPLEMENTARY INSULATED GATE FIELD EFFECT TRANSISTORS

Lawrence Aloysius Murray, Somerville, N.J., assignor to RCA Corporation

Filed Oct. 21, 1969, Ser. No. 868,071

Int. Cl. H01l 7/44, 11/14

U.S. Cl. 148—187 9 Claims



The source and drain regions and the channel insulation of two complementary field effect transistors are diffused simultaneously during a single heat treatment so as to reduce the number of heat treatment steps required to make the device. The method may also include diffusing the well region for one of the field effect transistors during the same heat treatment step that the source and drain regions are diffused and the channel insulation is formed so as to further reduce the number of heat treatment steps.

ERRATUM

For Class 148—32.5 see:
Patent No. 3,700,433

3,700,508

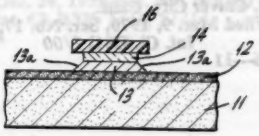
FABRICATION OF INTEGRATED MICROCIRCUIT DEVICES

Ralph S. Keen, Jr., Harleysville, Pa., assignor to General Instrument Corporation, Newark, N.J.

Filed June 25, 1970, Ser. No. 49,697

Int. Cl. C03c 15/00; C23f 1/02

U.S. Cl. 156—3 12 Claims



A process for manufacturing microcircuit devices having multi-level interconnection wiring formed as metal layers separated by layers of dielectric material. To avoid the development of cracks in overlying layers of dielectric material, tapered edges are formed on the underlying metal layer. Prior to photolithographic etching to form the wiring, the metal layer is covered with a relatively thin layer of phosphosilicate glass, as the dielectric, and photoresist is applied thereto. After the photoresist is developed, the exposed glass is removed by subjecting it to an HF etchant solution. Then the exposed surfaces of glass and metal are subjected to a solution of a metal etchant and a glass etchant. As the glass is removed by its etchant, the photoresist is undercut, thereby exposing to the metal etchant progressively more of the upper

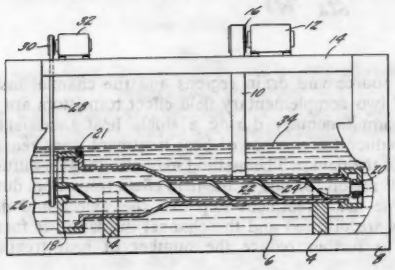
surface of the metal, with resultant formation of sloped or tapered edges on the metal wiring. The relative etch rates, as between the metal and the glass, is used to determine the angle of slope.

3,700,509

APPARATUS AND METHOD FOR CHEMICALLY MILLING THE INNER WALL SURFACE OF A HOLLOW SHAFT

John P. Devitt, Wethersfield, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Apr. 5, 1971, Ser. No. 131,322
Int. Cl. C23f 1/00, 3/04
U.S. Cl. 156—5 8 Claims



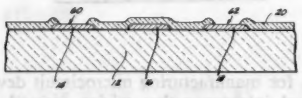
A method and apparatus for chemically milling the inner wall of a hollow shaft to the desired dimension by flowing an etchant through said shaft as by a helix rotating within the shaft and guiding the etchant against and over the inner wall surface of the shaft from one end to the other. The helix may be contoured substantially to the shape of the finished wall surface to more precisely control the etching operation.

3,700,510

MASKING TECHNIQUES FOR USE IN FABRICATING MICROELECTRONIC COMPONENTS

Carl E. Keene, Huntington Beach, and Ruth D. Bradley, Newport Beach, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 9, 1970, Ser. No. 17,399
Int. Cl. H01l 7/00
U.S. Cl. 156—11 8 Claims



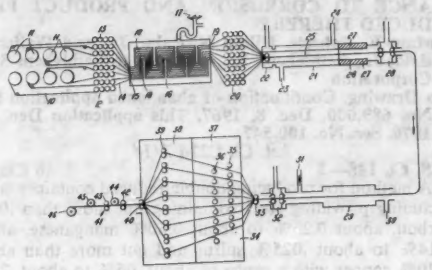
A film with tapered openings of selected size and shape is formed on a substrate surface by the progressive growth of the film about the base of a mushroom-shaped mask. The mask is formed on, and thereby masks, selected surface areas. The film is then deposited on the surface and the masks by sputtering to form the tapered openings simultaneously in the film about the base of the mask. These openings can later be used to advantage, particularly for gaining access to any of the selected surface areas beneath the film by etching and floating away the mushroom mask from the formed openings.

3,700,511

METHOD OF PRODUCING TAPES OF LONGITUDINALLY ALIGNED CARBON FIBRES

Ian Whitney, Wirksworth, Edward Bailey White, Gedling, and Michael Roger Rowland, Linby, England, assignors to Secretary of State for Defence, London, England

Filed July 31, 1970, Ser. No. 59,874
Claims priority, application Great Britain, Aug. 4, 1969, 38,869/69
Int. Cl. B29h 9/04; B32b 31/00
U.S. Cl. 156—60 10 Claims



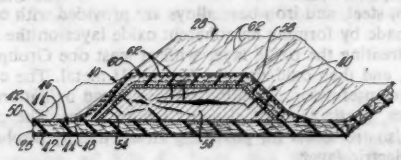
A method of producing tapes of carbon fibres in which a sheet of longitudinally aligned polyacrylonitrile fibres is pyrolysed and subsequently divided longitudinally to form a plurality of tapes of the carbon fibres thus produced.

3,700,512

METHOD OF FORMING A FLUID RETAINING WALL

Lee E. Pearson, Newark, and Jeri O. Clark, Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation

Original application Feb. 14, 1967, Ser. No. 616,088. Divided and this application Sept. 5, 1969, Ser. No. 870,956
Int. Cl. B32b 17/04
U.S. Cl. 156—62.4 9 Claims

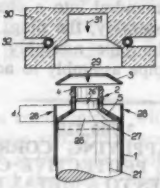


A composite wall of reinforced synthetic resin, for retaining both gases and liquids, that is particularly adapted for underground use in gasoline storage tanks, which are resistant to external compression forces; such as, water flooded earth. The wall is characterized by a very high stiffness factor, produced by a combination of spaced ribs of filament wound material and that are hollow, retained on top of a chopped strand-resin wall, where the chopped strand bridges the spaces between the ribs.

A process involving the steps of forming a tank end cap on a mandrel and thereafter supporting the end cap in space and laying up a resin-rich wall layer of chopped strand and resin in joined relation to the end cap, and curing the wall partially; then forming over the outer surface of the wall a hollow shell structure which comprises a combination of woven roving and filament wound layers

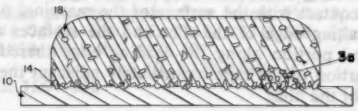
superimposed and saturated with wet resin. Then completely curing the composite wall to produce a monolithic structure.

3,700,513
METHOD OF MAKING TUBE
Karl Haberhauer, Upper Palatinate, Manfred Jutzi, Alt-Leiningen, and Reinhold Kiess, Eisenberg, Germany, assignors to C. F. Spiess & Sohn
Filed Sept. 18, 1969, Ser. No. 858,958
Int. Cl. B29c *27/02*
U.S. Cl. 156—69 **3 Claims**



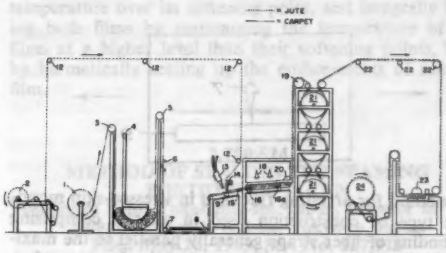
A container tube comprises a tubular body and a prefabricated head secured upon one end of said body. The body may be formed by wrapping a plastic laminated foil sheet about a spindle, or it may be a length of extruded plastic tubing. The body has an inturned shoulder terminating in an edge that is embedded or otherwise so disposed as to be protected against contact with the tube contents. The tube has a welded longitudinal seam wherein the edges are shielded from contact with the tube contents. Welding heat and pressure are provided by an induction coil mounted in a non-metallic member adapted to press the junctures to be fused against a high heat conductive support such as a metal spindle or block.

3,700,514
MAKING LAYERED STRUCTURES
Ralph Zito, Jr., Westford, Mass., assignor to The Zito Company, Inc., Derry, N.H.
Filed Feb. 2, 1971, Ser. No. 111,939
Int. Cl. B32b *31/12*
U.S. Cl. 156—280 **7 Claims**



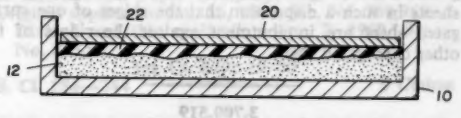
Forming a two-layer laminate from layers formed of different thermoplastic materials, of which the first thremoplastic material has a substantially higher softening temperature than the second, by spreading into the surface of the first thermoplastic material particles of a porous filler of irregular configuration, slightly softening this surface and applying pressure to imbed the particles only partially but firmly into the first thermoplastic material, cooling this first layer, placing the material of the second layer on this surface, and subjecting the two layers to a temperature below the softening range of the first thermoplastic material but within the softening range of the second to adhere the second thermoplastic material to the exposed surfaces of the filler particles.

3,700,515
METHOD OF APPLYING A BACKING TO A CARPET AND PRODUCT
Claude Edward Terry, Rockmart, Ga., assignor to Textile Rubber & Chemical Company, Dalton, Ga.
Filed Feb. 2, 1971, Ser. No. 111,860
Int. Cl. D05c *15/00*
U.S. Cl. 156—72 **4 Claims**



A carpet is formed by adhering a secondary backing to a primary backing with a thixotropic polyurethane composition so that there is substantially complete saturation of the bundle wrap with the composition without penetration through the primary backing. The composition contains water, a polyol with a hydroxyl number less than 100, a diisocyanate, a filler and a catalyst and has an initial viscosity of between 30,000 and 100,000 cps. #7 spindle Brookfield RVF, a pot life of between 10 and 60 seconds and is expandable between 100 and 400 when completely reacted. It is applied to the underside of the primary backing with a doctor knife and heated. A secondary backing is applied to the uncured composition after it is spread on the primary backing and the resultant laminate is subjected to pressure prior to curing to disintegrate substantially all of the cells in the polyurethane.

3,700,516
METHOD OF MAKING CELLULAR PLASTIC BUILDING PANEL
Wayne S. Sullivan, Iowa City, Iowa, assignor to Camelot Stone, Inc., Iowa City, Iowa
Filed Dec. 29, 1970, Ser. No. 102,437
Int. Cl. B32b *5/18, 31/14*
U.S. Cl. 156—79 **4 Claims**



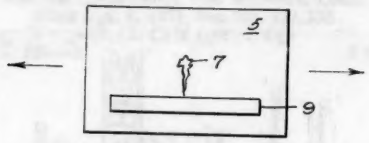
A method for producing decorative building panels for use in both exterior and interior construction. The panels have an insulating cellular plastic core with a cement veneer permanently bonded to the core. The exposed veneer surface of the panel can be of any desired shape or color to simulate brick, stone, etc., and is produced by making an impression in a bed of dry cement and allowing liquid plastic to solidify in the molds thus formed. The liquid plastic will form a solid core with a thin veneer of the dry cement impregnated to it, the veneered surface having the shape of the initial impression made.

3,700,517

METHOD FOR ARRESTING PROPAGATING FRACTURES IN STRESSED-SKIN MONOCOQUE TYPE OF CONSTRUCTION

Charles D. Roach, Newport News, Va., assignor to the United States of America as represented by the Secretary of the Army

Filed Nov. 24, 1970, Ser. No. 92,443
Int. Cl. B23p 7/04
U.S. Cl. 156—94 4 Claims



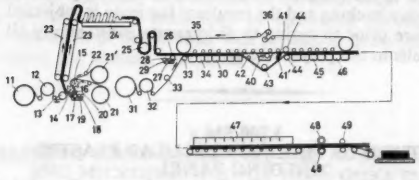
A method for arresting fractures in stressed-skin monocoque type of construction used in aircraft comprising the bonding of fiber straps generally parallel to the maximum load trajectory thereby arresting the fracture when it progresses to the fiber straps.

3,700,518

METHOD FOR MANUFACTURING A COMPOSITE CORRUGATED PAPER BOARD

Koichiro Ohmori, Fujisawa, Japan, assignor to Honshu Paper Limited, Tokyo, Japan

Original application Dec. 11, 1969, Ser. No. 884,279. Divided and this application Mar. 17, 1971, Ser. No. 125,249
Int. Cl. B32b 29/00, 3/10, 31/00
U.S. Cl. 156—152 1 Claim



There are described a method for producing a composite corrugated paper board which may be termed "X-wave type corrugated paper board" for its sectional structure and a method for manufacturing the same. The X-wave type paper board consists of two corrugated sheets of paper interposed between two liner sheets, said corrugated sheets being bonded to each other and to the liner sheets in such a disposition that the ridges of one corrugated sheet are in abutment against the ridges of the other corrugated sheet.

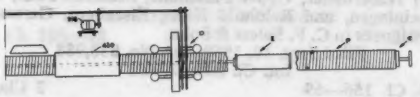
3,700,519

METHODS OF FORMING A FIBER REINFORCED PIPE ON AN INFLATABLE MANDREL

J. Warne Carter, Wichita Falls, Tex., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of application Ser. No. 577,035, Sept. 2, 1966, now Patent No. 3,507,412, which is a continuation-in-part of application Ser. No. 387,372, Aug. 4, 1964, now abandoned; of which application Ser. No. 705,564, Feb. 14, 1968 is a continuation. This application May 13, 1969, Ser. No. 824,153
Int. Cl. B65h 81/06; B65c 3/26
U.S. Cl. 156—156 33 Claims

A method and apparatus is provided for continuously making fiber reinforced plastic pipe in which a conveyor tube is formed on an axially fixed hollow rotatable mandrel. A plurality of bands of resin impregnated fiber elements are wound on the conveyor tube as it advances to provide the pipe assembly. The terminal end of the generated pipe assembly is sealed with a plug. A fluid under



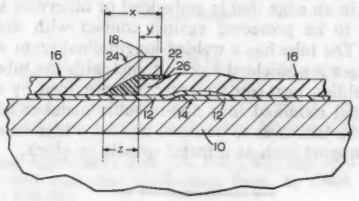
pressure is fed through the hollow mandrel and out the forward end of the mandrel into a chamber formed by the generated pipe assembly, the plug, and a fluid sealing means within the pipe assembly being generated, thereby causing the pipe assembly to advance.

3,700,520

METHOD OF APPLYING CORROSION AND MECHANICAL PROTECTIVE COATINGS IN FORM OF TAPES TO A METAL PIPE

Ralph Hielema, Locust Hill, Ontario, Canada, assignor to The Kendall Company, Chicago, Ill.

Filed July 13, 1970, Ser. No. 54,489
Claims priority, application Canada, Apr. 16, 1970, 080,271
Int. Cl. B31c 13/00; B65h 81/00; F16l 9/14
U.S. Cl. 156—162 6 Claims



A method of coating a pipe and a pipe coated thereby, said method comprising the steps of progressively spirally winding a corrosion protective adhesive coated plastic tape onto the outer surface of the pipe with a spiral overlap, covering the coated pipe by progressively winding a film thereon with a predetermined overlap, and, as the film is wound onto the coated pipe, introducing and distributing under pressure a hot melted adhesive into intimate contact with the surface of the marginal portion of the trailing edge of the film and the surfaces of the overlapped portion along the leading edge thereof and of the portion of the tape immediately adjacent the leading edge of the film.

3,700,521

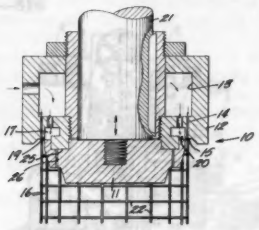
METHOD FOR THE EXTRUSION OF PLASTIC NET AND NETLIKE STRUCTURES

Bernard J. Gaffney, Stillwater, Minn., assignor to Conwed Corporation

Filed Nov. 10, 1969, Ser. No. 875,476
Int. Cl. B29c 19/00; D04h 3/16
U.S. Cl. 156—167 5 Claims

An improved extrusion apparatus and method for the extrusion of plastic net and netlike structures is provided. The apparatus is comprised of a plurality of die members at least one of which reciprocates in a vertical direction. One of the die members has a plurality of orifices therein for the extrusion of a first group of strands and at least one other die member has a forming surface thereon which

coacts with a second forming surface on another die member to form a variable opening for the independent extrusion of a second group of strands. The distance between each orifice is maintained constant and the second group of strands is extruded at a point below that at

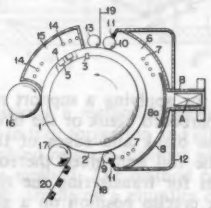


which the orifices communicate with a polymer supply. The forming surfaces and orifices are so arranged relative to each other that at least one group of strands is forcefully urged toward the other group to cause the two groups of strands to weld together subsequent to extrusion.

3,700,522
PROCESS OF MAKING HONEYCOMB PANELS
Clifford L. Wonderly, Orlando, Fla., assignor to Florida Gas Company, Winter Park, Fla.
Filed Dec. 3, 1970, Ser. No. 94,897
Int. Cl. B31d *3/02*; B32b *3/12*
U.S. Cl. 156—197 **14 Claims**

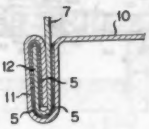
A honeycomb sandwich panel manufacturing process for applying an adhesive to the edges of paper honeycomb core material for the application of flat surfaces to the honeycomb. Paper honeycomb which has been expanded and cured is compressed and an adhesive is applied to the compressed honeycomb which is then caused to expand to its expanded position. The flat surfaces are applied and pressed to the two edges of the expanded honeycomb and the adhesive cured for securing the edge surfaces of the honeycomb to the flat surfaces to form the sandwich panel.

3,700,523
METHOD FOR MANUFACTURING PLASTIC CUSHIONING MATERIAL
Wasuke Sato, Kawasaki, Shigeyuki Hatakeyama and Masashi Koide, Yokohama, Sadao Yamamoto, Kawasaki, and Mitsumaro Fujisawa, Yokohama, Japan, assignors to Showa Denko K.K., Tokyo, Japan
Filed Jan. 30, 1970, Ser. No. 7,156
Claims priority, application Japan, Feb. 1, 1969, 44/7,049; Feb. 25, 1969, 44/13,582; Jan. 22, 1970, 45/5,491, 45/5,492
Int. Cl. B32b *3/30*
U.S. Cl. 156—210 **2 Claims**



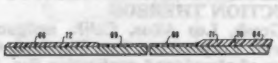
A method and apparatus for manufacturing plastics cushioning material which consists in feeding a first film made of thermoplastic material to the surface of a molding drum having a plurality of molding recesses formed therein, and air exhausting means communicating with said recesses and a cooling means disposed near the bottom of said recesses, heating said first film to a temperature over its softening point, pressing it for embossment with compressed air, feeding a second film similarly made of thermoplastic material to the surface of said molding drum to be attached to said first film in such a manner that said second film closes the openings of embossments formed on said first film, heating said second film to a temperature over its softening point, and integrally bonding both films by maintaining the temperature of both films at a higher level than their softening points, thereby hermetically sealing up the embossments of said first film.

3,700,524
METHOD OF SEALING THE SEAMING PORTIONS OF A CAN
Yoshikatsu Sato, Yokohama-shi, Japan, assignor to Toyo Seikan Kabushiki Kaisha, Tokyo-to, Japan
Filed May 26, 1969, Ser. No. 827,716
Claims priority, application Japan, June 4, 1968, 43/37,785
Int. Cl. B29d *23/00*
U.S. Cl. 156—218 **2 Claims**



A can body is sealed to the top or bottom plate by applying a rubber compound to the periphery of the plate, then applying a film of urethane resin to the rubber to improve the resistance to solvents which may be in the can contents, and then rolling up the laminated portion of the plate overlappingly with the end of the can in such a way that a triple rolled up layer of the laminated portion mates with a U-shaped inverted fold of the can body.

3,700,525
METHOD OF MAKING A LAMINATE HAVING VARYING THICKNESS
Glenn M. Violette, Greenwich, and Leon J. Paquin, Glens Falls, N.Y., and James A. Lock, Mobile, Ala., assignors to International Paper Company, New York, N.Y.
Original application Jan. 26, 1968, Ser. No. 700,968. Divided and this application Apr. 3, 1969, Ser. No. 835,837
Int. Cl. B29c *19/00*
U.S. Cl. 156—244 **5 Claims**



The present invention contemplates an apparatus, a process and a product produced by the process, whereby preselected areas of a moving paperboard substrate are coated with a thermoplastic film having zones of different thickness, so that the substrate areas are in predetermined

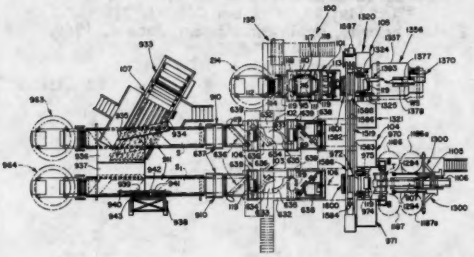
registry with the film zones, by employing a threaded deckle rod during the extrusion of the thermoplastic film. The threaded deckle rod imparts the varying thickness profile to the film.

3,700,526

TIRE BUILDING MACHINE HAVING MEANS ADVANCING A PLURALITY OF DRUMS THROUGH A PLURALITY OF ASSEMBLY STATIONS

Wilhelm Brey, Cuyahoga Falls, Ohio, William Hostetler, Santa Ana, Calif., and Earl Ferdnand Loeffler, Akron, Hubert Ernest Kolm, Louisville, and Fred Grove Elder, Atwater, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Feb. 11, 1970, Ser. No. 10,579
Int. Cl. B29h *17/20*
U.S. Cl. 156—396 **49 Claims**



A fully automatic machine for producing "green tires" or unvulcanized tire carcasses, especially suitable for making tubeless tires. The machine comprises a plurality of interconnected and dependent assemblies or stations where specialized operations, normally done semi-automatically or by hand, are carried out by mechanical devices acting in sequence. The machine includes a plurality of conventional tire building drums continuously moving between horizontally disposed, stationary table assemblies where innerliner and chafer strips, and first and second ply material are successively wrapped on the drums as they move across the table on which the material is positioned. The wrapped drums from these assemblies, are sent to turret units where they are arcuately positioned for receiving beads, tread cushion, stitching, strips of whitewall, if required, and are discharged from the collapsed drums for removal and storage. The stripped drums, or drums from which tires are removed, are automatically expanded and recycled through the assemblies for building more tire carcasses.

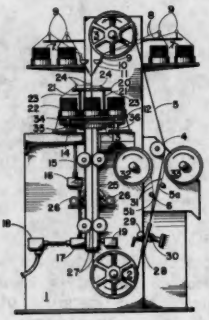
3,700,527

TRANSVERSE FILAMENT REINFORCING TAPE AND METHODS AND APPARATUS FOR THE PRODUCTION THEREOF

James L. Grosh, Los Altos, Calif., assignor to United Aircraft Corporation, East Hartford, Conn.

Continuation of abandoned application Ser. No. 641,963, May 29, 1967. This application Mar. 11, 1970, Ser. No. 18,740
Int. Cl. B65h *81/08*
U.S. Cl. 156—426 **4 Claims**

A longitudinally extending nonwoven tape comprising longitudinally extending tacking strands supporting a multiplicity of transverse filament bundles. The tape is manufactured by continuously depositing adhesive coated tacking strands onto both sides of a continuous moving double band and continuously winding filament bundles over said strands and around said band. The band is passed between rollers and heated to bond the filament to the tacking strand. The band is then passed against a cutter which severs the wound filaments between the bands and permits the longitudinally extending tape to be removed from the band. The tape is used to provide longitudinal reinforcement of reinforced plastic pipe by winding the tape around the mandrel in the pipe fabrication process.

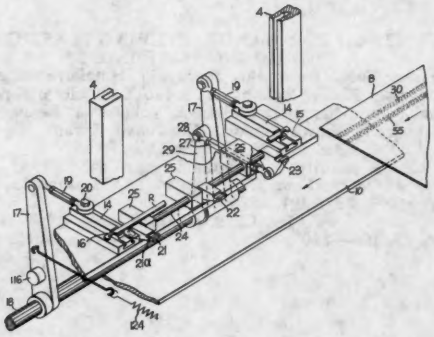


3,700,528

MACHINE FOR MAKING HANGING FILE FOLDERS

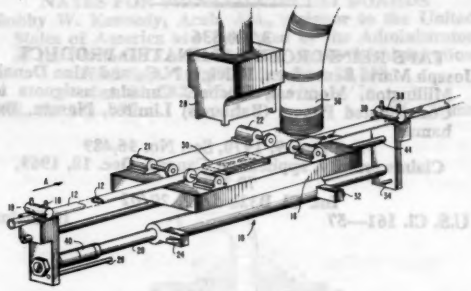
Arthur H. Kidd, Menomonee Falls, Wis., assignor to Condes Corporation, Milwaukee, Wis.

Filed June 28, 1971, Ser. No. 157,181
Int. Cl. B31f *1/00*
U.S. Cl. 156—475 **16 Claims**



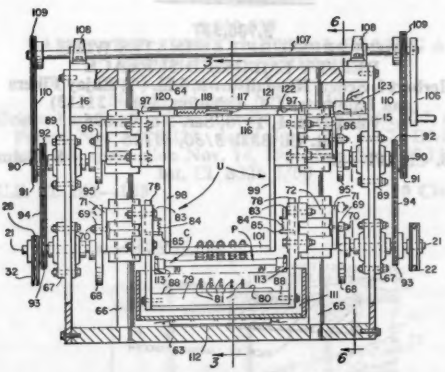
A machine for applying a support rod along opposite edges of a paperboard blank or the like in which the rod is glued to the blank and edges of the blank are then folded over the rod and glued thereover. The machine includes means for transferring the rods from a magazine and to a precise position on a glue pattern of the blank, and the machine also includes an edge turning means for the blank whereby the longitudinal edge of the blank is folded over the glued rod and firmly pressed into contact therewith.

3,700,529
METHOD AND APPARATUS FOR TUBULAR ARTICLES
Frank Monaghan, Glendale, Calif., assignor to M & H Plastics, Inc.
Filed Oct. 27, 1970, Ser. No. 84,362
Int. Cl. B32b *31/00, 15/34*
U.S. Cl. 156—510 **6 Claims**



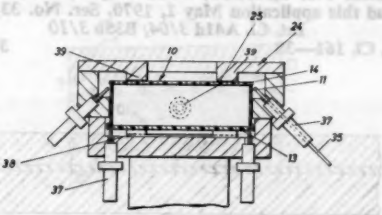
This invention relates to a tube sealing and cut-off machine comprising a machine adapted to take extruded plastic tubing and, by a reciprocating continuous feed, concurrently cutting off sections of the tubing by spaced operable knives and trimming dies and sealing end portions of said tubing by a sealing die.

3,700,530
APPARATUS FOR ASSEMBLING AND GLUING PAPER CUPS IN TRAY FORMATION
Albert L. Ehe, Jamaica Estates, N.Y., assignor to Multicup Automation Company, Inc., Long Island, N.Y.
Original application Nov. 22, 1968, Ser. No. 778,233, now Patent No. 3,579,399. Divided and this application Jan. 8, 1971, Ser. No. 105,064
Int. Cl. B32b *31/12*; B05c *1/00*
U.S. Cl. 156—559 **15 Claims**



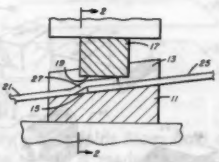
This invention discloses a method of assembling a plurality of paper cups in tray formation and gluing them together in said assembled relation together with apparatus for carrying out the method. The method consists essentially of the steps of: arranging a plurality of paper cups in a series of tray units, each of a predetermined cup number and formation, moving said tray units through a gluing station at which the cups are held in position relative to one another; applying glue to engaging cup portions; and discharging finished trays. The apparatus comprises, as characteristic elements an endless conveyor; cup receiving plates carried by the conveyor; a gluing station including a supply of heated glue below the upper ply of the conveyor, devices for holding cups in position in the plates while glue is applied, and glue applying means in the form of a gang of upright pile coated wires: means for indexing the conveyor with a stepped motion; mechanism for operating the cup holding devices and glue applying means in proper relation to movement of the conveyor, and a block out device for rendering the gluing means ineffective on certain predetermined steps to provide trays in a separated state.

3,700,531
APPARATUS FOR CLOSING A FILM CASSETTE MADE OF SYNTHETIC PLASTICS
Horst Schruff, Mulheim (Ruhr), Helmut Lehmann and Jakob Siefen, Leverkusen, Hermann Mathner, Cologne, Willi Adams, Leverkusen, and Gunter Weiss, Cologne, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Jan. 21, 1971, Ser. No. 108,524
Claims priority, application Germany, Feb. 21, 1970, P 20 08 103.2
Int. Cl. B05b *13/02*; B05c *5/00*
U.S. Cl. 156—575 **11 Claims**



A synthetic plastics film cassette which consists of a cassette body covered by a U-shaped cassette cover is closed by spraying a solvent between the cover and body of the cassette. The spraying arrangement consists of several measuring cylinders and pistons, with which certain positions on the cassettes are sprayed with solvents through thin tubes.

3,700,532
ULTRASONIC SPLICING
Charles W. Pierson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Original application July 15, 1968, Ser. No. 744,817, now Patent No. 3,519,507, dated July 7, 1970. Divided and this application Dec. 4, 1969, Ser. No. 870,529
Int. Cl. B32b *31/20*; B23k *27/00*
U.S. Cl. 156—580 **1 Claim**

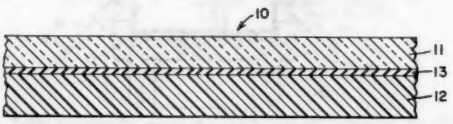


Splicing the overlapping ends of thermoplastic moving picture films between an anvil and an ultrasonic horn which have plane non parallel surfaces inclined at an acute angle to one another. This eliminates the embrittlement which occurs when the horn and anvil have parallel surfaces.

3,700,533
DECORATIVE PANEL
Robert D. Schmitz, Burlingame, Calif., assignor to Hodges Chemicals Company
Filed Oct. 23, 1970, Ser. No. 83,355
Int. Cl. B32b *3/10, 5/16, 21/02*
U.S. Cl. 161—5 **9 Claims**

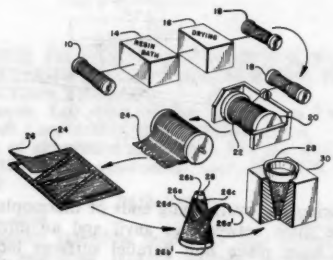
Twigs and limbs which ordinarily would be wasted are formed in a mold with a resin and after the resin has set, slices are made of the thus molded material. The slices are decorative and may be used as wall panels, as a veneer on a plywood base or as flooring.

3,700,534
HARD FACED PLASTIC ARMORPLATE
Richard L. Cook, Phoenix, Ariz., assignor to Goodyear Aircraft Corporation, Akron, Ohio
Original application Mar. 28, 1963, Ser. No. 268,765, now Patent No. 3,509,833, dated May 5, 1970. Divided and this application May 1, 1970, Ser. No. 33,952
Int. Cl. A41d *3/04;* **B35b** *3/10*
U.S. Cl. 161—38 **3 Claims**



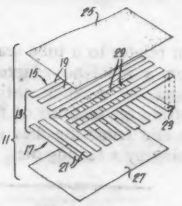
Armorplate comprising a relatively thick base of transparent stretched methyl methacrylate and a relatively thick facing layer of transparent window glass is secured to the base by a relatively thin layer of methyl methacrylate cement.

3,700,535
CARBON FIBER STRUCTURE AND METHOD OF FORMING SAME
J. C. McCoy and James W. Steele, Overland Park, Kans., assignors to the United States of America as represented by the United States Atomic Energy Commission
Filed Mar. 12, 1971, Ser. No. 123,696
Int. Cl. B32b *5/12, 31/12*
U.S. Cl. 161—47 **9 Claims**



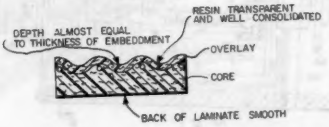
An annular carbon fiber structure including a multiplicity of carbon fiber layers, with each layer composed of a plurality of similar elongated quadrangular carbon fiber sheets laid side by side along the long dimensions of said sheets in generally spiral fashion about the structure with each sheet being made of unidirectional fibers laid side by side parallel to a long dimension of said sheets and with the fiber sheets of adjoining overlying layers disposed in oppositely angled relationship with respect to fibers of sheets in an adjoining layer and the process for making the same.

3,700,536
TAPE REINFORCED LAMINATED PRODUCT
Joseph Maria Bentvelzen, Raleigh, N.C., and Alan Dennis Millington, Montreal, Quebec, Canada, assignors to Consolidated Papers (Bahamas) Limited, Nassau, Bahamas
Filed Dec. 9, 1970, Ser. No. 96,489
Claims priority, application Canada, Dec. 18, 1969, 70,332
Int. Cl. B32b *5/12, 29/02*
U.S. Cl. 161—57 **10 Claims**



A laminate and method of making same formed from a central reinforcing layer comprising a plurality of spaced-apart oriented ribbons of polymeric material, arranged in parallel side-by-side relationship, said ribbons having a thickness of .5 to 3 mil, a width of greater than 1/32 inch, an ultimate elongation of less than 50%, and a lateral spacing between ribbons of less than 1 inch.

3,700,537
HIGH PRESSURE LAMINATES WITH DEEPLY EMBOSSED SURFACE
Herbert I. Scher, Randallstown, Md. (% Enjay Fibers and Laminates Co., Odenton, Md. 21113)
Filed Dec. 1, 1970, Ser. No. 94,096
Int. Cl. B32b *3/30, 31/26*
U.S. Cl. 161—89 **8 Claims**



A high pressure laminate with deeply embossed surface is produced using as a decorative sheet beneath the overlay, a relatively thick element of varying cross section, such as woven cane, lace, or a paper sheet containing holes of various shapes. During laminating, a thermoplastic layer is included between the parting sheet and the upper caul plate, the thermoplastic layer is reduced to the fluid state during the laminating operation, and the resultant laminate is found to be debossed to a depth that is substantially equal to the thickness variation in the

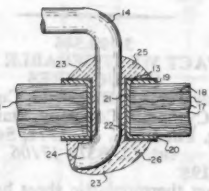
ply of varying cross section. In addition, the depressed portions of the laminate surface are fully consolidated. The process enables economic production of decorative high pressure laminates having deeply embossed surfaces, which are highly desirable to architects and furniture designers.

3,700,538

POLYIMIDE RESIN-FIBERGLASS CLOTH LAMINATES FOR PRINTED CIRCUIT BOARDS

Bobby W. Kennedy, Arab, Ala., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Sept. 10, 1970, Ser. No. 71,048
Int. Cl. B32b *15/08, 15/14, 31/26*
U.S. Cl. 161—93 6 Claims



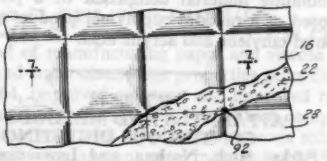
Nonflammable printed circuit board laminates having a low coefficient of thermal expansion in the thickness direction are made of multiple plies of polyimide-resin-impregnated fiberglass cloth. A stacked array of resin-impregnated cloth sheets is heated under pressure to B-stage curing temperature, and the resulting laminate is post cured by further heating in air. Copper cladding is applied by placing adhesive-coated foil in contact with the laminate before or after B-stage curing. Further control of thermal and electrical properties of the laminate is realized by use of a finely divided inorganic filler such as silica or calcium silicate.

3,700,539

LAMINATED SHEET MATERIAL HAVING A CONTOURED SURFACE

Joseph Pufahl, 81 Gerard Ave., New Hyde Park, N.Y. 11040

Original application Mar. 22, 1962, Ser. No. 181,527, now Patent No. 3,328,221, dated June 27, 1967. Divided and this application Nov. 14, 1966, Ser. No. 605,115
Int. Cl. B32b *3/00*
U.S. Cl. 161—120 10 Claims



Laminated sheet material having a resilient base and at least one overlying layer wherein the layer is adhered to the base in selected areas by an adhesive therebetween, the adhesive penetrating the base and causing the surface layer to have a contoured appearance.

3,700,540

BIAXIALLY ORIENTED POLYETHYLENE-1:2-DIPHENOXYETHANE-4:4'-DICARBOXYLATE SHEETS

Richard Harold Barclay Buteux, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, Millbank, London, England

No Drawing. Continuation-in-part of application Ser. No. 717,960, Apr. 1, 1968. This application Mar. 24, 1970, Ser. No. 22,384
Claims priority, application Great Britain, Apr. 20, 1967, 18,285/67
Int. Cl. B29d *7/24*; B32b *27/36*
U.S. Cl. 161—165 4 Claims

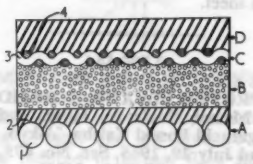
Balanced biaxially oriented sheet of polyethylene-1:2-diphenoxyethane-4:4'-dicarboxylate of thickness at least 750 gauge which has been heat set before orientation.

3,700,541

PRINTERS' BLANKETS

Ronald Horace Shrimpton, Lichfield and Keith William Dunkley, Birmingham, England, assignors to Dunlop Holdings Limited, London, England

Filed Apr. 5, 1971, Ser. No. 131,142
Claims priority, application Great Britain, Apr. 11, 1970, 17,303/70; June 24, 1970, 30,611/70
Int. Cl. B32b *3/26, 5/16*
U.S. Cl. 161—160 17 Claims



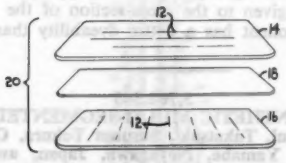
A printers' blanket comprises a printing surface, at least one strengthening layer and, between the surface and the layer, a compressible layer of a cellular resilient polymer the cells of which have been produced by incorporation of hollow microspheres in the polymer.

3,700,542

SAFETY WINDSHIELD AND METHOD OF MAKING SAME

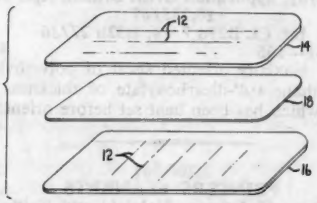
Harry P. Davis, Tarentum, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 3, 1971, Ser. No. 139,412
Int. Cl. B32b *17/10*
U.S. Cl. 161—125 16 Claims



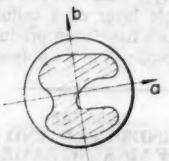
In making safety windshields from float or sheet glass, at least one of the sheets is made from glass cut WSW. Preferably, a blank cut WLW is paired with a blank cut WSW, the usual plastic interlayer being provided. This technique improves quality or yield and is of particular usefulness in making windshields from extra-thin float or sheet glass. Windshields made in this manner have distortion lines in one glass sheet oriented at an angle with respect to distortion lines in a second glass sheet.

3,700,543
SAFETY WINDSHIELD AND METHOD OF MAKING SAME
Harry P. Davis, Tarentum, Pa. assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Nov. 12, 1970, Ser. No. 88,580
Int. Cl. B32b 17/10
U.S. Cl. 161—165 6 Claims



In making safety windshields from float glass, a blank cut WLW is paired with a blank cut WSW, the usual plastic interlayer being provided. This technique improves quality or yield and is of particular usefulness in making windshields from extra-thin float glass. Windshields made in this manner have distortion lines in one glass sheet oriented perpendicularly with respect to distortion lines in a second glass sheet.

3,700,544
COMPOSITE SHEATH-CORE FILAMENTS HAVING IMPROVED FLEXURAL RIGIDITY
Masao Matsui, Osaka-fu, Japan, assignor to Kanegafuchi Boseki Kaisha, Tokyo, Japan
Filed July 29, 1965, Ser. No. 475,667
Int. Cl. D02g 3/36
U.S. Cl. 161—175 7 Claims



A composite filament of synthetic fiber-forming high polymer is melt-spun having two different components arranged in a sheath-core relationship and exhibiting improved flexural rigidity due to an appropriate non-circular shape given to the cross-section of the core. The sheath component has a better dyeability than the core component.

3,700,545
NOVEL SYNTHETIC MULTI-SEGMENTED FIBERS
Masao Matsui, Takatsuki, Susumu Tokura, Osaka, and Masahiro Yamabe, Neyagawa, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 12, 1969, Ser. No. 875,673
Claims priority, application Japan, Nov. 13, 1968, 43/83,151; July 31, 1969, 44/60,893, 44/60,894, 44/60,895
Int. Cl. D01d 5/28
U.S. Cl. 161—175 28 Claims

A novel synthetic multi-segmented fiber having a touch similar to natural fiber, an excellent water absorbing property and an improved gloss, which comprises at least 10 fine segments which are composed of at least one component of fiber-forming linear polyamide and polyester, extend substantially continuously along the longitudinal direction of the fiber and occupy at least a part of the periphery of the unitary multi-segmented fiber, said fine segments having their cross-sectional shapes and areas irregular and uneven to each others, and adjacent segments having an average space therebetween of at least 0.1μ at least on the periphery of the unitary multi-segmented fiber can be produced. When a part of polyamide or polyester is removed from the multi-layer structure, a fiber having a silk-like deep gloss and highly improved water absorbing property and touch can be obtained.

3,700,546
HIGH IMPACT WEATHERABLE RIGIDIFIED STRUCTURES
Joseph Francis Terenzi, Ridgefield, Conn., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Feb. 17, 1971, Ser. No. 116,242
Int. Cl. B32b 17/06
U.S. Cl. 161—195 10 Claims

A high impact thermoplastic sheet having at least one surface thereof reinforced with a fiberglass and polyester resin composition and a method for the production thereof, are disclosed.

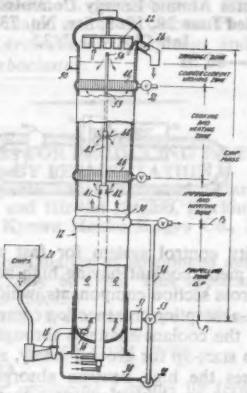
3,700,547
BONDING PROCESS FOR POLYPHENYLENE OXIDEDIELECTRIC MICROWAVE CIRCUITS AND BONDED ASSEMBLY
Homer E. Satterfield, North Syracuse, N.Y., Keith D. Stottlemyer, Statesboro, Ga., and David L. Brown, Liverpool, and Leslie Roberts, Baldwinsville, N.Y., assignors to the United States of America as represented by the Secretary of the Army
Filed Oct. 20, 1970, Ser. No. 82,251
Int. Cl. C09j 5/06, 7/00
U.S. Cl. 161—213 11 Claims

Microwave striplines are formed by intimately bonding circuit planes to polyphenylene oxide shield planes by use of heat and pressure in combination with an interface bonding material comprised of a polymeric resin composed of a random copolymer product of copolymerization of ethylene and acrylic acid.

3,700,548
APPARATUS AND METHODS OF CONTINUOUS DIGESTING
John Parker Rich, Nashua, and Lawrence Allan Carlsmith, Amherst, N.H., assignors to Improved Machinery, Inc., Nashua, N.H.
Filed Apr. 28, 1971, Ser. No. 138,295
Int. Cl. D21c 3/26
U.S. Cl. 162—17 3 Claims

Methods for the continuous pulping of a compacted mass of wood chips in an upright elongated reaction vessel having means for feeding wood chips substantially continuously into the inlet end of the vessel and discharging

them substantially continuously from the opposite outlet end of the vessel, the mass of wood chips being advanced through the vessel for treatment in liquid submergence by advancing liquid through a portion of the submerged chip mass adjacent the inlet end of the vessel. In one embodiment this is accomplished by recirculating from one intermediate strainer back to the entrance end of the vessel, at a turbulent liquid flow rate directed generally along the length of the chip mass for a substantial distance of at least about one-half the cross section dimension of the mass, such providing a wood chip propelling force effective to advance the mass of wood chips continuously



throughout the length of the vessel. In another embodiment, it is accomplished by generating liquid propelling pulses, preferably by utilizing an accumulator at one end of the vessel and a cycling timer for operating it, such propelling pulses being effective to cause the rate of movement of the submergence liquid relative to the wood chips in the mass to vary cyclically to produce a cyclic advancing movement of the liquid at a rate at least not less than that of the alternating intervening movement of the liquid, such advancing movement of the liquid being effective to advance the wood chips throughout the length of the vessel from the input to the output end thereof.

3,700,549

PROCESS FOR MANUFACTURING CROSS-LINKED PAPER AND VISCOSE PULP AND PRODUCTS PRODUCED ACCORDING TO THE PROCESS

Ingemar Liss-Albin Croon and Nils Verner Blomqvist, Ornskoldsvik, Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Continuation of application Ser. No. 597,794, Nov. 29, 1966. This application Sept. 14, 1970, Ser. No. 72,796
Claims priority, application Sweden, Dec. 1, 1965, 15,579/65
Int. Cl. D21f *11/00*; D21h *5/12*
U.S. Cl. 162—157 C **11 Claims**

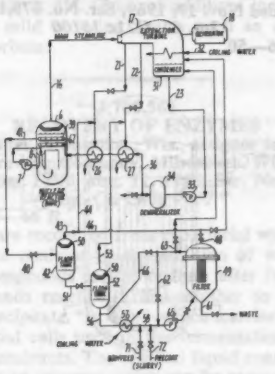
1. A method of manufacturing paper and viscose pulp having improved water-absorption properties according to SCAN–P–13:64, improved softness, and improved resistance to alkali according to SCAN-C2:61, which comprises reacting cellulose pulp with an alkaline aqueous solution containing alkali in an amount of at most about 2.1% by weight of the solution and from about 0.5 to about 12% by weight of the dry pulp, and a cross-linking agent selected from the group consisting of polyhalides, polyepoxides, and epoxyhalides in an amount within the ranges from about 0.05 to about 8.8% by weight of the solution and from about 0.5 to about 50% by weight of the dry pulp, at a temperature of between 25° C. and 95° C. at which cross-linking of the cellulose takes place, for a period of time sufficient to increase resistance to an 18% aqueous sodium hydroxide solution by from about 1 to about 16%.

3,700,550

PROCESS FOR PURIFYING WATER UTILIZED IN A BOILING WATER REACTOR

Daniel A. Shiells, 1155 Jones St., #308, San Francisco, Calif. 94109

Filed Nov. 21, 1969, Ser. No. 878,619
Int. Cl. G21c *19/30*
U.S. Cl. 176—37 **5 Claims**



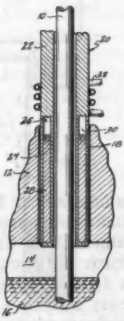
The purity of reactor coolant is controlled by removing a stream of water from the reactor system at the pressure existing in the reactor. The removed stream is then passed to at least one low pressure area wherein the pressure is reduced to release flash steam which is employed to heat feedwater fed to the system. The water remaining after flashing is filtered to remove solids and is demineralized and is then returned as pure feedwater to the system.

3,700,551

DEVICE TO PREVENT SODIUM FREEZING AROUND SHAFT PENETRATION

John H. Germer, San Jose, Calif., assignor to the United States of America as represented by the United States Atomic Energy Commission

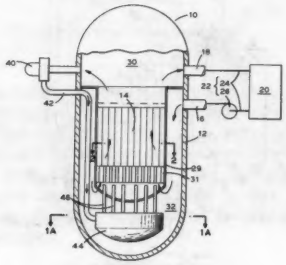
Filed Feb. 18, 1971, Ser. No. 116,575
Int. Cl. G21c *1/02*
U.S. Cl. 176—40 **10 Claims**



A device for preventing sodium vapor from freezing around a movable shaft extending into a pool of hot sodium through a cover gas provided thereabove. The device consists of a sealed hollow-wall tube containing

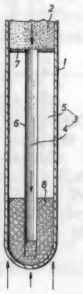
sodium positioned around the shaft in the region of possible freezing with its lower end in heat exchange contact with the cover gas. Means may be provided for passing inert gas through the annulus between the shaft and the hollow-wall tube countercurrent to sodium vapor rising from the pool of hot sodium.

3,700,552
NUCLEAR REACTOR WITH MEANS FOR ADJUSTING COOLANT TEMPERATURE
Donald C. Schluderberg, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.
Filed Nov. 19, 1969, Ser. No. 878,125
Int. Cl. G21c *15/00*
U.S. Cl. 176—50 **4 Claims**



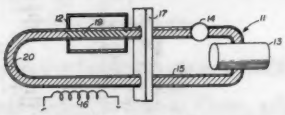
A nuclear reactor system which includes a reactor pressure vessel having a core predominately made up of fuel elements that define coolant flow passageways within the core, is connected in primary coolant flow communication with a heat exchanger and provided with apparatus for circulating primary coolant around the exchanger for mixing with coolant returning from the heat exchanger to adjust the temperature of the coolant entering some of the fuel element passageways, thereby adjusting the average temperature of the coolant leaving the core.

3,700,553
NUCLEAR REACTOR FUEL ELEMENT
Siegfried Malang, Karlsruhe, Germany, assignor to Gesellschaft fur Kernforschung mbH, Karlsruhe, Germany
Filed Dec. 15, 1969, Ser. No. 885,108
Claims priority, application Germany, Dec. 23, 1968, P 18 16 544.1
Int. Cl. G21c *3/18*
U.S. Cl. 176—72 **11 Claims**



A nuclear reactor fuel element has a can surrounding the fuel and defining at least one void kept under pressure and cooled by a flowing coolant. The void forms a fission gas plenum subdivided into two regions separated from each other so as to be gastight by means of a movable separating element. One region is connected with the fissile and fertile material to accommodate the fission gases, while the other region contains steam which condenses as a function of the increasing quantity of fission gases in the one region.

3,700,554
SPACE REACTOR GROUND SAFETY AND CONTROL SYSTEM
Viktor E. Hampel, Livermore, Joseph D. Lee, III, Fremont, and Carl E. Walter, Pleasanton, Calif., assignors to the United States of America as represented by the United States Atomic Energy Commission
Filed June 20, 1968, Ser. No. 738,680
Int. Cl. G21c *7/22*
U.S. Cl. 176—86 M **6 Claims**



A reactivity control system for fast nuclear reactors using liquid metal coolant having high and low neutron-absorption cross section components, which maintains the high neutron-absorption cross section components in solidified form in the coolant channels throughout the reactor core prior to start-up for ground safety, and which liquefies and mixes the high neutron absorption component with a low neutron-absorption cross section component, to adjust the reactor reactivity to the desired operating level. Reactivity is subsequently grossly adjusted by adding to or replacing a portion of the coolant mixture with additional quantities of one or the other appropriate component.

3,700,555
METHOD AND APPARATUS FOR LYMPHOCYTE SEPARATION FROM BLOOD
Rudolph M. Widmark, New York, Bernard Lichtenstein, Yorktown Heights, Lynn Paseltiner, Yonkers, and Jacques Padawer, Hastings-on-Hudson, N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.
Filed Oct. 12, 1970, Ser. No. 79,913
Int. Cl. B01d *43/00*
U.S. Cl. 195—1.8 **12 Claims**

New and improved method and apparatus for the separation of lymphocytes from whole blood samples with very high, heretofore unattainable combined degrees of purity, yield and viability are provided and comprise the physiological stabilization of the white cells or leukocytes immediately upon the withdrawal of the blood from the patient, the subsequent mixture of the blood with a suitable separating agent including sensitized magnetic particles and a suitable erythrocyte sedimenting agent to form a whole-blood sample-separating agent mixture, the incubation of the whole blood sample-separating agent mixture to effect the tagging of the phagocytic leukocytes, to the substantial exclusion of the lymphocytes, by the sensitized magnetic particles through leukoadhesion, phagocytosis and clumping, respectively, the settling and removal of a major portion of the erythrocytes, passage of the incubated whole blood sample-separating agent mixture through magnetic separating means to separate the thusly tagged phagocytic cells from the lymphocytes, and the removal and collection of the thusly separated lymphocytes. The method and apparatus of the invention are fully automatable, and are particularly adapted to the separation of the lymphocytes from the whole blood samples from a plurality of different patients on a continuous flow basis.

3,700,556
PROCESS FOR PRODUCING L-VALINE
Shigeo Abe, Tokyo, and Kenichiro Takayama, Chofu-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan
No Drawing. Continuation of abandoned application Ser. No. 565,104, July 14, 1966. This application July 15, 1968, Ser. No. 744,691
Claims priority, application Japan, July 16, 1965, 40/42,597
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 R 12 Claims

L-valine is produced by fermentation by culturing an isoleucine-, threonine- or homoserine-requiring microorganism in an aqueous nutrient medium under aerobic conditions at 25–40° C. Hydrocarbons are used in the medium as the major source of carbon. Preferred strains employed are *Arthrobacter paraffineus* and *Corynebacterium hydrocarboclastus*.

3,700,557
PROCESS FOR PRODUCING L-LYSINE BY FERMENTATION
Kiyoshi Nakayama, Sagamihara-shi, Haruo Tanaka, Machida-shi, and Hiroshi Hagino, Hachioji-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan
No Drawing. Continuation of abandoned application Ser. No. 563,030, July 6, 1966. This application Aug. 6, 1968, Ser. No. 750,456
Claims priority, application Japan, Mar. 4, 1966, 41/15,376
Int. Cl. C12d *13/06*
U.S. Cl. 195—29 11 Claims

A process for producing L-lysine by fermentation. A microorganism which requires threonine, methionine, arginine, histidine, leucine, isolecucine, phenylalanine, cystine or cysteine and is capable of producing L-lysine is cultured in an aqueous nutrient medium containing a source of carbon and nitrogen under aerobic conditions. Microorganisms belonging to the genera Brevibacterium, Corynebacterium, Arthrobacter and Microbacterium are exemplified.

3,700,558
PRODUCTION OF L-TRYPTOPHAN BY FERMENTATION
Josef Ernst Thiemann, Como, and Hermes Pagani, Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy
No Drawing. Filed Nov. 18, 1968, Ser. No. 776,784
Claims priority, application Italy, Nov. 20, 1967, 22,882/61
Int. Cl. C12d *13/06*
U.S. Cl. 195—29 6 Claims

The invention is concerned with the improved production of L-tryptophan by fermentation of a microorganism named S–10 (ATCC No. 21,336), obtained by mutation of *Bacillus subtilis*. The yields obtained, particularly on synthetic medium, are much higher than those described in previous processes of L-tryptophan production.

3,700,559
METHOD OF PRODUCING TRYPTOPHAN BY FERMENTATION
Isamu Shiio and Hiroko Sato, Kanagawa-ken, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan
No Drawing. Filed Aug. 21, 1970, Ser. No. 66,109
Claims priority, application Japan, Aug. 28, 1969, 44/68,178
Int. Cl. C12d *13/06*
U.S. Cl. 195—29 8 Claims

Certain mutants of Brevibacterium, Corynebacterium, Microbacterium and Micrococcus which are resistant to 5-methyl-DL-tryptophan produce L-tryptophan in a culture medium.

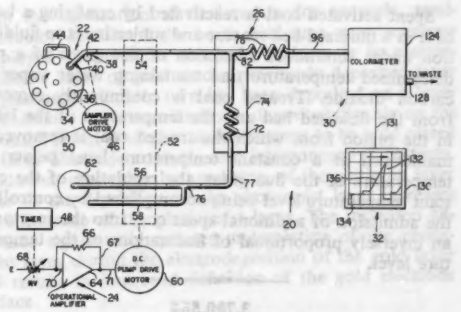
3,700,560
ENZYMATIC PRODUCTION OF CATECHOL FROM PHENOL
Robert A. Oppermann, 9104 Lynwood Drive, Oak Lawn, Ill. 60453
No Drawing. Filed Oct. 23, 1970, Ser. No. 83,170
Int. Cl. C12d *13/00*
U.S. Cl. 195—49 4 Claims

In the enzymatic production of catechol from phenol utilizing tyrosinase, the monophenolase activity is favored by utilizing crude Neurospora enzyme directly or in combination with mushroom tyrosinase together with a catechol trapping metal salt selected from barium, lead, copper, aluminum and ferric ammonium citrate adjusted to a pH of about 5.8. Optional additives include anionic buffers and mild reducing agents such as cysteine and sodium ascorbate.

3,700,561
RECOVERY OF ENZYMES
Jack Ziffer, Milwaukee, Wis., assignor to Pabst Brewing Company, Milwaukee, Wis.
No Drawing. Filed Aug. 11, 1969, Ser. No. 849,148
Int. Cl. C07g *7/02*
U.S. Cl. 195—66 R 9 Claims

Enzymes are recovered from a bacterial whole fermentation culture medium by the addition of water soluble inorganic compounds to the medium after fermentation. The compounds react with one another to produce an insoluble precipitate "in situ" which carries down with it the bacterial cells used in the fermentation and other various contaminants. The residual liquid contains the desired enzyme or enzymes which can be recovered.

3,700,562
METHOD AND APPARATUS FOR SAMPLE ANALYSIS ON A CONTINUOUS FLOW BASIS
Stanley W. Morgenstern, Teaneck, N.J., Daniel L. Vlastelica, Pomona, N.Y., Leon Chaparian, Waldwick, N.J., and Alfred Kiederer, Mount Vernon, N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.
Filed Aug. 31, 1970, Ser. No. 68,298
Int. Cl. G01n *31/14*
U.S. Cl. 195—103.51 S 12 Claims



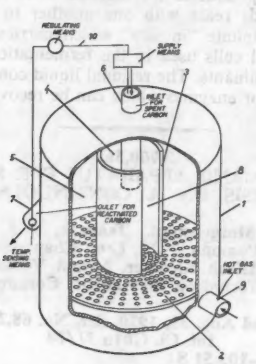
New and improved method and apparatus for the fully automatic, highly accurate quantitative analysis of a series of samples with regard to a constituent thereof on a continuous flow basis through rate reaction determination are provided and are operable through the continuous mixing of said samples and a suitable reactant in constant proportion, and the flow of the resultant sample constituent-reactant mixtures by pumping on a continuous basis through reaction promoting means to promote the sample-reactant rate reaction in such manner that different portions of each of the sample-reactant mixtures are

reacted for different times to effect a differential in a characteristic of said mixtures as developed as a result of said reaction. Following this, the thusly reacted sample-reactant mixture portions are flowed through detector means for detection of said characteristic differential and resultant provision of an output signal which is indicative of the sample constituent quantity of interest. A step change in the flow rate of each of said sample-reactant mixtures through said reaction promoting means is utilized to provide for the different sample-reactant mixture portion reaction times. As specifically disclosed herein, the method and apparatus of the invention are particularly adaptable to the analysis of a series of blood samples with regard to an enzyme constituent thereof.

3,700,563
METHOD OF REACTIVATING SPENT ACTIVATED COAL

Joachim Karweil, Essen and Josef Degel, Bochum, Germany, assignors to Bergwerksverband G.m.b.H., Essen, Germany

Filed Aug. 19, 1969, Ser. No. 851,308
Claims priority, application Germany, Aug. 20, 1968, P 17 92 323.7
Int. Cl. C10b *49/10*
U.S. Cl. 201—1 **9 Claims**



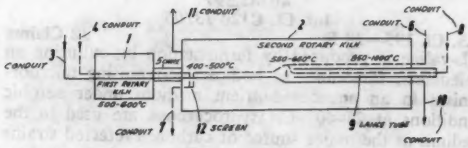
Spent activated coal is reactivated by confining a body of it in a fluidized-bed reactor and subjecting it to fluidization under continuous admission of flue gases of a predetermined temperature and containing water vapor or carbon dioxide. Treated coal is continuously removed from the fluidized bed and the temperature of the latter in the region from which the treated coal is removed is maintained at a constant temperature level below the temperature of the flue gases, the regulation of the constant temperature level being accomplished by controlling the admission of additional spent coal into the reactor as an inversely proportional of fluctuations of the temperature level.

3,700,564
CONTINUOUS PROCESS OF PRODUCING SHAPED METALLURGICAL COKE

Willibald John, Frankfurt, Paul Schmalfeld, Bad Homburg, and Paul Lange and Roland Rammler, Frankfurt, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Reuterweg, Germany

Filed Sept. 4, 1969, Ser. No. 855,431
Claims priority, application Germany, Sept. 5, 1968, P 17 96 129.4
Int. Cl. C01b *47/20, 49/18*
U.S. Cl. 201—6 **5 Claims**

Improved process of producing shaped coke articles made by pelletizing coal with or without admixture therewith of coke and/or minerals such as ore, which process carbonizes the shaped article in a first stage for about 2 to 5 minutes with a concurrent solid, particulate heat carrier at about 500 to 600° C.; a second stage for about 30 to 90 minutes with a counter-current or transverse current

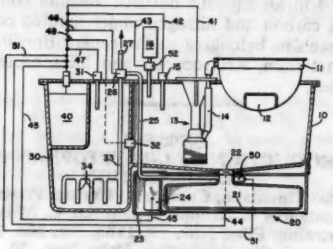


solid, particulate heat carrier having an initial temperature of about 400 to 500° C. increasing to a final temperature of 500 to 600° C.; and then in a third stage with a counter-current or transverse current solid, particulate heat carrier having an initial temperature of about 550 to 650° C. increasing to a final temperature of 850 to 1000° C.

3,700,565
MICROWAVE SEWAGE SYSTEM WITH DISTILLATION MEANS

Alan H. Cornish, Robert C. Helke, and Alex N. LeDonne, Dayton, Ohio, and Hugh E. Masters, Old Bridge, N.J., assignors to Koehler-Dayton, Dayton, Ohio

Filed Apr. 3, 1970, Ser. No. 25,475
Int. Cl. B01d *3/00*; C02c *1/04*; E03d *7/00*
U.S. Cl. 203—1 **23 Claims**



A self-contained sewage system in which a microwave energy source is provided to vaporize the liquid phase of the sewage so that it may be removed from the system and the interval between servicings of the system lengthened. The sewage is transferred from the sewage receiving tank to an evaporating tank for evaporation and, in certain embodiments used in situations where power is not at a premium, a portion of the liquid vaporized from the sewage may be returned to the system for flushing purposes.

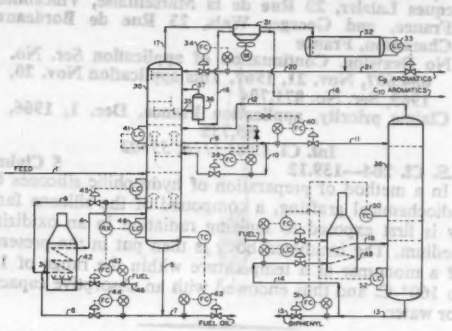
3,700,566
BIPHENYL PURIFICATION PROCESS BY PLURAL STAGE FRACTIONAL DISTILLATION

Robert M. Bellinger, Bartlesville, Okla., and John T. Cabbage, Guayama, Puerto Rico, assignors to Phillips Petroleum Company

Filed Oct. 13, 1969, Ser. No. 865,650
Int. Cl. C07c *7/04, 3/58*
U.S. Cl. 203—1 **4 Claims**

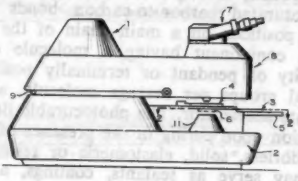
A method is disclosed for recovering a biphenyl stream for recirculation to a hydrodealkylation process for pro-

ducing benzene which involves fractionating the product stream after the removal of the benzene to produce a C_9



aromatics cut, a C_{10} aromatics cut, a fuel oil cut and a biphenyl stream of about 88 percent purity.

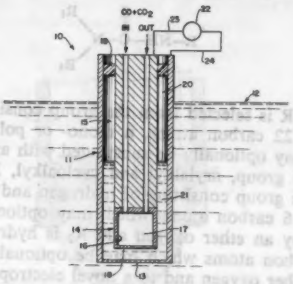
3,700,567
WAFER LOADING APPARATUS
Karl-Heinz Johannsmeier, 555 W. Middlefield, Road, Mountain View, Calif. 94040
Filed Nov. 12, 1970, Ser. No. 88,726
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 B **15 Claims**



An optical alignment and exposure device is provided with wafer loading apparatus including a rotary loading arm pivotably mounted over a loading platform. The rotary loading arm includes a forked portion for engaging the side edge of a first unexposed wafer placed in a wafer loading position on the loading platform. It also includes another diametrically opposed forked portion for engaging the side edge of a second previously exposed wafer supported in a work area position on a vacuum chuck. The rotary loading arm rotates to slide the first unexposed wafer into the work area position on the vacuum chuck while at the same time sliding the second previously exposed wafer from the work area position on the vacuum chuck into an off-loading recess in the loading platform.

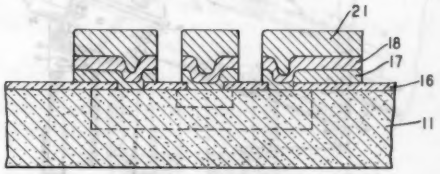
3,700,568
ELECTROCHEMICAL CARBON METER
Nathan Fuhrman, Shrub Oak, N.Y., granted to the United States Atomic Energy Commission under the provisions of 42 U.S.C. 2182
Filed Apr. 14, 1969, Ser. No. 815,947
Int. Cl. G01n *27/26, 27/30, 27/40*
U.S. Cl. 204—1 T **13 Claims**

The carbon content in a high temperature fluid such as molten metal or a carburizing gas is measured by immersing thereinto a probe to form an equilibrium electrolytic cell. The probe is in the form of a metallic closed-end tube impervious to the fluid but permeable to carbon. Inside the tube is a carbon reference electrode electrically



insulated therefrom except through its annulus which is filled with a fused salt electrolyte containing carbon ion charge carriers in solution.

3,700,569
METHOD OF METALLIZING DEVICES
Kenneth Russ Newby, Murray Hill, and Dennis Robert Turner, Chatham Twp., Morris County, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Sept. 10, 1971, Ser. No. 179,287
Int. Cl. C23b *5/48, 5/46*
U.S. Cl. 204—15 **8 Claims**

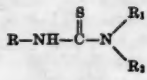


In the fabrication of devices, as, for example, semiconductor devices of the beam lead type, one technique employed to metallize electrode surfaces is to electrodeposit a layer of gold onto a previously deposited layer of platinum, which in turn has been deposited on a layer of titanium. A photoresist layer, deposited directly on the platinum layer, is used to define regions to be gold plated to form electrode contacts and interconnective patterns. Oxidation, preferably by anodizing, of the platinum layer prior to the deposition of the photoresist layer increases the adherence of the photoresist layer. The increased adherence significantly reduces underplating of the photoresist layer during the electrodeposition of the gold layer and results in improved definition of the gold electrode surface.

3,700,570
ZINC ACID BATH ELECTROPLATING
Josef Hartenstein, Hilden Rhineland, Germany, assignor to Henkel & Cie G.m.b.H., Dusseldorf, Germany
No Drawing. Filed Oct. 1, 1970, Ser. No. 77,321
Claims priority, application Germany, Oct. 13, 1969, P 19 51 558.3
Int. Cl. C23b *5/12, 5/46*
U.S. Cl. 204—55 R **7 Claims**

Novel acid aqueous electroplating baths for forming lustrous zinc deposits containing a water-soluble zinc

salt, usual lustering agents and wetting agents, optionally an additional conducting salt and a thiourea derivative of the formula



(I)

wherein R is selected from the group consisting of alkyl of 6 to 22 carbon atoms, a mono- or polynuclear aryl which may optionally be substituted with an aliphatic or aromatic group, arylalkyl and cycloalkyl, R_1 is selected from the group consisting of hydrogen and hydroxyalkyl of 2 to 6 carbon atoms which may optionally be interrupted by an ether oxygen and R_2 is hydroxyalkyl of 2 to 6 carbon atoms which may be optionally interrupted by an ether oxygen and to a novel electroplating method for forming lustrous zinc deposits and zinc deposits formed by said method.

3,700,571

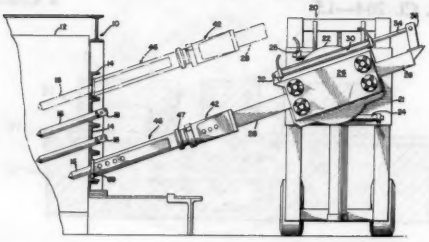
METHOD FOR MANIPULATING ALUMINUM REDUCTION CELL ANODE PINS

Raymond Joseph Dill, Florence, Ala., assignor to Reynolds Metals Company, Richmond, Va.

Original application May 3, 1965, Ser. No. 452,493, now Patent No. 3,493,486, dated Feb. 3, 1970. Divided and this application July 10, 1969, Ser. No. 862,103

Int. Cl. C22d *3/12*

U.S. Cl. 204—67 **1 Claim**



Method and apparatus for extracting the anode pins of an electrolytic reduction cell and for resetting such pins while still hot. The equipment comprises a modified fork truck having, in addition to the conventional vertically movable carriage and a revolving apron, an extensible boom mounting a puller-driver mechanism which includes a pin clamping head. Means are also provided for reacting the pin withdrawal force against the cell structure.

3,700,572

METHOD OF ELECTROLYTICALLY REDUCING AROMATIC HYDROCARBONS

Takefumi Hatayama, Yoshihiko Hamano, and Tsuyoshi Yamamoto, Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed Dec. 16, 1970, Ser. No. 98,931

Claims priority, application Japan, Dec. 22, 1969, 44/102,440

Int. Cl. C07b *29/06;* C07c *5/10, 13/48*

U.S. Cl. 204—73 R **7 Claims**

This invention relates to a method of the production of dihydroaromatic hydrocarbons which comprises subjecting a catholyte composed of a heterogeneous mixture of an aromatic hydrocarbon and an aqueous solution of one or more quaternary ammonium salts to electrolysis carried out at a temperature from 30° to 100° C. and subsequently recovering the resulting dihydro aromatic hydrocarbon.

3,700,573

METHOD OF PREPARATION OF HYDROPHILIC SILICONES BY RADIOCHEMICAL GRAFTING

Jacques Laizier, 23 Rue de la Marseillaise, Vincennes, France, and Georges Wajs, 23 Rue de Bordeaux, Charenton, France

No Drawing. Continuation of application Ser. No. 684,607, Nov. 21, 1967. This application Nov. 20, 1969, Ser. No. 871,704

Claims priority, application France, Dec. 1, 1966, 85,735

Int. Cl. C08f *1/16, 35/02*

U.S. Cl. 204—159.13 **5 Claims**

In a method of preparation of hydrophilic silicones by radiochemical grafting, a compound of the silicone family is first exposed to ionizing radiation in an oxidizing medium. The irradiated body is then put in the presence of a monomer at a temperature within the range of 120 to 160° C. and thus endowed with an absorptive capacity for water.

3,700,574

PHOTOCURABLE LIQUID POLYENE-POLYTHIOL POLYMER COMPOSITION

Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Application June 23, 1970, Ser. No. 44,607, which is a continuation-in-part of abandoned application Ser. No. 617,801, Feb. 23, 1967, which in turn is a continuation-in-part of abandoned application Ser. No. 567,841, July 26, 1966. Divided and this application June 25, 1971, Ser. No. 156,970

Int. Cl. C08d *1/00;* C08f *1/16;* C08c *11/54*

U.S. Cl. 204—159.14 **17 Claims**

The invention disclosed is for a new photocurable liquid polymer composition which includes a liquid polyene component having a molecule containing at least two unsaturated carbon-to-carbon bonds disposed at terminal positions on a main chain of the molecule, a polythiol component having a molecule containing a multiplicity of pendant or terminally positioned —SH functional groups per average molecule, and a photocuring rate accelerator. The photocurable liquid polymer composition upon curing in the presence of actinic light forms odorless, solid, elastomeric or resinous products which may serve as sealants, coatings, adhesives and molded articles.

3,700,575

METHOD OF FORMING TRANSPARENT FILMS OF ZnO

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Paul H. Egli, 73 Maple Ave., Collingwood, N.J. 08108

No Drawing. Filed Nov. 26, 1969, Ser. No. 880,398

Int. Cl. C23c *15/00*

U.S. Cl. 204—192 **8 Claims**

A method of forming thin transparent film of zinc oxide on a transparent refractory substrate, which comprises sputtering pure zinc metal to form a thin metallic film on the substrate and then reacting the zinc film with oxygen from air to form a luminescent and transparent ZnO coating.

3,700,576

ION-ACTIVITY MEASURING ELECTRODE

René A. Bloch, Savion, Mordechay Furmansky, Petach Tiqva, and Saul Gassner, Rehovot, Israel, assignors to Hydronautics-Israel Ltd., Rehovot, Israel

Filed Oct. 27, 1970, Ser. No. 84,300

Claims priority, application Israel, Feb. 27, 1970, 33,983

Int. Cl. G01n *27/46*

U.S. Cl. 204—195 M **9 Claims**

A measuring electrode for the selective determination of the activity of certain ions in aqueous solutions. A

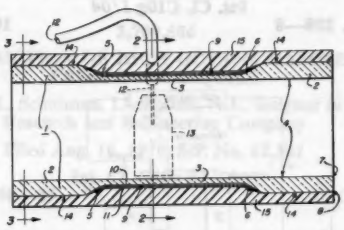
holder is provided with a protruding conductor and the protruding conductor is covered by a cap removably attached to the holder. An ion-specific membrane is located over an aperture in the cap and the cap is adapted to hold a standard electrolyte solution.

3,700,577

pH SENSING APPARATUS

Oscar H. Grauer, Philadelphia, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed July 21, 1966, Ser. No. 566,877
Int. Cl. G01n 27/36
U.S. Cl. 204—195 G 17 Claims



Through-flow pH-sensing apparatus including a thin glass membrane of pH sensitive glass having a thickness of the general order of .010", more or less, whose inner surface is generally a projection of the inner surface of the pipe-line on which the apparatus is mounted, such inner surface of said membrane facing and being adapted to and in contact with the liquid passing through said pipeline, the outer surface of said membrane being de-glazed to form minute recesses therein, an electrically-conductive coating on said de-glazed outer surface, and a dielectric membrane-backing covering and in intimate contact with the outer surface of said membrane and the metal coating thereon and insulating the said conductive coating from the inner surface of said membrane.

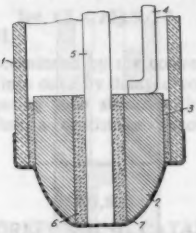
3,700,578

APPARATUS FOR MEASURING THE CONCENTRATION OF DISSOLVED OXYGEN IN AN AQUEOUS SOLUTION

John Stephen Clifton, Harpenden, and Dawood Parker, London, England, assignors to National Research Development Corporation, London, England

Filed Aug. 10, 1970, Ser. No. 62,553
Claims priority, application Great Britain, Aug. 11, 1969, 40,041/69
Int. Cl. G01n 27/46
U.S. Cl. 204—195 P 4 Claims

A membrane of silicone rubber is arranged in contact with two electrodes, for example of silver and lead respectively, so that an electrochemical cell will be formed when water with an appropriate ion content is absorbed by the membrane. In use the characteristics of the cell are affected by oxygen diffusing into the membrane from a solution under investigation.

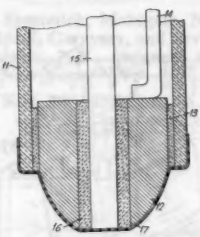


3,700,579

APPARATUS FOR MEASURING THE CONCENTRATION OF DISSOLVED OXYGEN IN AN AQUEOUS SOLUTION

John Stephen Clifton, Harpenden, and Dawood Parker, London, England, assignors to National Research Development Corporation, London, England

Filed Mar. 4, 1971, Ser. No. 121,077
Claims priority, application Great Britain, Mar. 12, 1970, 11,949/70
Int. Cl. G01n 27/46
U.S. Cl. 204—195 P 6 Claims



A membrane of a fluorocarbon polymeric material is arranged in contact with two electrodes so that an electrochemical cell will be formed when water with an appropriate ion content is absorbed by the membrane. In use the characteristics of the cell are affected by oxygen diffusing into the membrane from a solution under investigation.

3,700,580

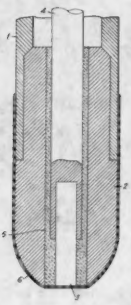
APPARATUS FOR MEASURING THE CONCENTRATION OF DISSOLVED OXYGEN IN AN AQUEOUS SOLUTION

Norman MacLeod, Edinburgh, Scotland, and David Proctor, Highett, Victoria, Australia, assignors to National Research Development Corporation, London, England

Filed Aug. 10, 1970, Ser. No. 62,502
Claims priority, application Great Britain, Aug. 11, 1969, 40,040/69
Int. Cl. G01n 27/46
U.S. Cl. 204—195 P 6 Claims

A water-absorbent oxygen-permeable membrane for example of polyethylene, is arranged in contact with two

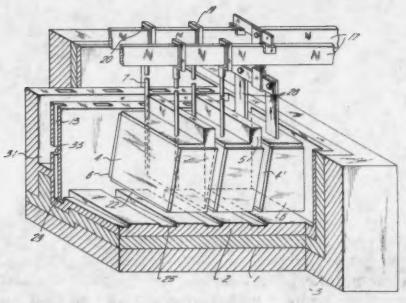
electrodes, for example of silver and lead respectively, so that an electrochemical cell will be formed when water with an appropriate ion content is absorbed by the membrane. In use the characteristics of the cell are affected by oxygen diffusing into the membrane from a solution under investigation.



3,700,581
CRYOLITIC VAT FOR THE PRODUCTION OF ALUMINUM BY ELECTROLYSIS

Giuseppe de Varda, Milan, Italy, assignor of a fractional part interest to Montecatini Edison S.p.A., Milan, Italy

Continuation of application Ser. No. 651,448, July 6, 1967. This application Mar. 17, 1970, Ser. No. 19,623
Claims priority, application Italy, July 6, 1966, 15,623/66, Patent 19,888
Int. Cl. C22d *3/02, 3/12*
U.S. Cl. 204—243 R **7 Claims**



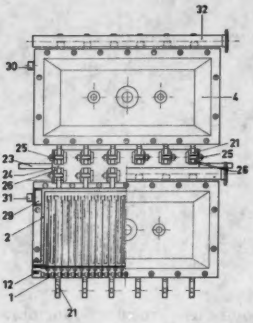
Disclosed are monocell and multicell furnaces for fused bath electrolysis of alumina (Al_2O_3) dissolved in molten fluoride baths. The invention is characterized by an internal vat constituted entirely or partially of substantially pure cryolite, either natural or synthetic.

3,700,582
ELECTROLYTIC CELL

Umberto Giacopelli, Via Piave, Rosignano Solvay, Italy

Filed Sept. 16, 1970, Ser. No. 72,566
Claims priority, application Germany, Sept. 18, 1969, P 19 47 157.9
Int. Cl. B01k *3/00*
U.S. Cl. 204—275 **12 Claims**

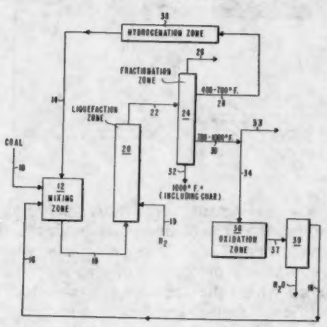
An electrolytic cell has a removable conductive wall carrying spaced parallel plate electrodes. The wall is composed of a series of elongated vertical elements which are individually secured to adjacent elements by male-female threaded members which screw into one another. The borders of the electrode plates are clamped between successive wall elements with selected pressure by individually tightening the threaded members.



3,700,583
COAL LIQUEFACTION USING CARBON RADICAL SCAVENGERS

James E. Salamony, Summerville, S.C., and William H. Starnes, Jr., Baytown, Tex., assignors to Esso Research and Engineering Company

Filed Mar. 19, 1971, Ser. No. 125,970
Int. Cl. C10g *1/04*
U.S. Cl. 208—8 **10 Claims**



Coal liquefaction yields are increased by liquefying the coal in a liquefaction zone as a slurry in a hydrogen-donor solvent in the presence of a carbon radical scavenger selected from quinones and the halogens iodine, bromine and chlorine, and the hydrogen halides thereof. Preferably a coal liquids stream which boils within the range from about 500° F. to about 1000° F. is oxidized to generate quinones, and the oxidized stream is recycled to the liquefaction zone.

3,700,584
HYDROGENATION OF LOW RANK COAL

Edwin S. Johanson, Princeton, Ronald H. Wolk, Lawrence Township, and Clarence A. Johnson, Princeton, N.J., assignors to Hydrocarbon Research, Inc., New York, N.Y.

Filed Feb. 24, 1971, Ser. No. 118,225
Int. Cl. C10g *1/08*
U.S. Cl. 208—10 **12 Claims**

Low rank coal having a high oxygen content is hydrogenated into hydrocarbonaceous products while re-

ducing the hydrogen consumption by conducting the hydrogenation of such coal in first and second stage ebullated bed reaction zones with the separate withdrawal of the gasiform effluent stream containing carbon monoxide and carbon dioxide between the first and second hydrogenation stages.

3,700,585

DEWAXING OF OILS BY SHAPE SELECTIVE CRACKING AND HYDROCRACKING OVER ZEOLITES ZSM-5 AND ZSM-8

Nai Yuen Chen, Hopewell Township, Mercer County, Stanley J. Lucki, Runnemede, and William E. Garwood, Haddonfield, N.J., assignors to Mobil Oil Corporation

No Drawing. Filed Oct. 10, 1969, Ser. No. 865,470

Int. Cl. C10g *13/02, 11/02*

U.S. Cl. 208—111 11 Claims

Straight-chain hydrocarbons and slightly branched-chain hydrocarbons are selectively converted utilizing novel crystalline zeolites having unique molecular sieving properties. The catalyst preferably contains acidic cations and can also contain a component having a hydrogenation/dehydrogenation function. The process of this invention is particularly useful for the dewaxing of hydrocarbon oils including removal of high freezing point paraffins from jet fuel to lower freezing, as well as improving the octane rating of naphtha fractions.

3,700,586

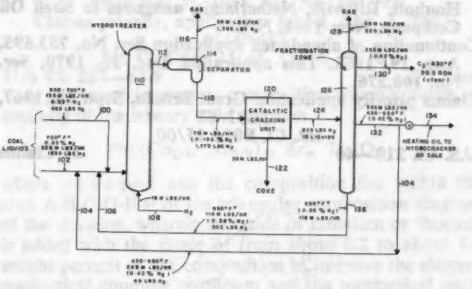
PRODUCTION OF HIGH OCTANE GASOLINE FROM COAL LIQUIDS

Bernard L. Schulman, Livingston, N.J., assignor to Esso Research and Engineering Company

Filed Aug. 10, 1970, Ser. No. 62,301

Int. Cl. C10g *23/00*

U.S. Cl. 208—89 10 Claims



A high octane gasoline is obtained, without addition of lead-containing compounds, by the hydro-treating and catalytic cracking of coal-derived liquids. A heating oil stream obtained from the catalytic cracking step is recycled to the hydrotreater, resulting in an improvement in the Research Octane Number (clear; i.e., measured without addition to tetraethyl lead) of the naphtha obtained from the coal-derived liquid. Hydrocracking of the heating oil, with the resultant reduction in octane number, is avoided. Catalytic cracking with a molecular sieve containing catalyst is preferred, because of its highly selective action in denitrogenating the heating oil stream.

3,700,587

SILICONE OIL ANTIFOAM

James A. Hyde, Downers Grove, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Filed Mar. 1, 1971, Ser. No. 119,756

Int. Cl. C10g *9/14*

U.S. Cl. 208—131 2 Claims

The foaming occasioned by the conversion of residual petroleum stocks into coke by delayed coking processes is controlled by treating such stocks with a polydimethyl siloxane which has a centistoke viscosity of at least 150,000.

3,700,588

NOVEL HYDROREFORMING CATALYSTS AND A METHOD FOR PREPARING THE SAME

Joseph Edouard Weisang and Philippe Engelhard, Le Havre, France, assignors to Compagnie Francaise de Raffinage, Paris, Seine, France

No Drawing. Filed Feb. 13, 1970, Ser. No. 11,325

Claims priority, application France, Feb. 14, 1969, 6903646

Int. Cl. C10g *35/08;* B01j *11/78, 11/08*

U.S. Cl. 208—139 8 Claims

Novel hydroreforming catalysts are disclosed which improve the reforming of hydrocarbon feeds. These novel catalysts are a combination of the platinum group metals with tin and/or lead.

3,700,589

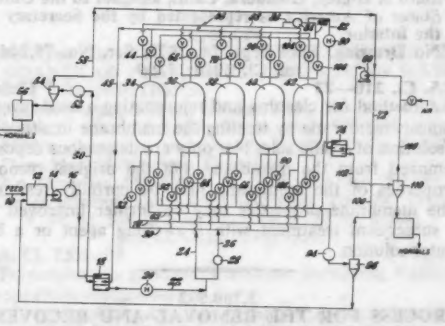
ISOPARAFFIN-n-PARAFFIN SEPARATION PROCESS

Martin Francis Symoniak, Mahopac, N.Y., David Allen Torke, Dusseldorf, Germany, and Ervine Stout Holmes, Yorktown Heights, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 14, 1970, Ser. No. 71,895

Int. Cl. C10g *25/04*

U.S. Cl. 208—310 6 Claims



Normal paraffins are separated from admixture with non-normal paraffins in the vapor phase at super-atmospheric pressure using a fixed adsorption bed containing a 5-A. zeolitic molecular sieve adsorbent. High purity normals are obtained if the adsorption stroke is continued until the stoichiometric point of the normals mass transfer zone has traversed to between 85 and 97 percent of the bed length and thereafter two countercurrent purge

stages using a non-sorbable permanent gas are employed, the first being only sufficient to flush the vapors from the bed void space.

3,700,590

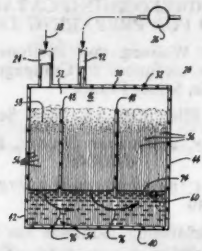
SEPARATION OF ORGANIC SOLIDS FROM WASTE LIQUIDS

Robert Edward Burton, Willits, Calif., assignor to Microphor, Inc., Willits, Calif.

Continuation-in-part of abandoned application Ser. No. 842,667, July 17, 1969. This application Aug. 31, 1970, Ser. No. 68,428

Int. Cl. C02c *1/04*

U.S. Cl. 210—17 **29 Claims**



System for treating waste liquids to separate organic solid contaminants and to reduce the biological oxygen demand of the clarified liquids so that they can be freely and safely discharged from the system. Liquid wastes are introduced to the system together with oxygen-containing gas which may be under slight pressure. The system makes use of masses or bundles of bark fiber or other fibrous material containing microbiological communities which thrive upon and consume the organic solid wastes. The liquid waste treating systems are particularly adapted for marine, rail, vehicular or aircraft use in the form of small compact wholly self-contained units.

3,700,591

CLEANING OF USED MEMBRANE WITH OXALIC ACID

Willard S. Higley, Glendora, Calif., assignor to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed Sept. 24, 1970, Ser. No. 75,246

Int. Cl. B01d *13/00*

U.S. Cl. 210—23 **7 Claims**

A method for cleaning and rejuvenating a used reverse osmosis membrane by treating the membrane in situ with a solution of oxalic acid. Not only are deleterious deposits removed from the membrane, but the original osmotic properties of the membrane may be partially restored. The membrane properties may be further improved by a subsequent treatment with a swelling agent or a hot water solution.

3,700,592

PROCESS FOR THE REMOVAL AND RECOVERY OF MINERAL POLLUTANTS FROM WATER

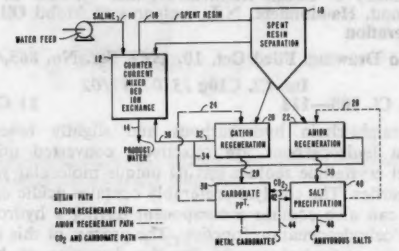
David O. De Pree, Lommis, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Dec. 4, 1970, Ser. No. 95,286

Int. Cl. B01d *33/16, 15/06*

U.S. Cl. 210—33 **15 Claims**

This patent describes a process for the treatment of an aqueous stream containing ionic pollutants to remove the ions from the stream and recover the ions which comprises: optionally countercurrently passing said aqueous stream through a bed of mixed ion exchange material to remove ionic pollutants from the stream and produce a substantially ion-free water, removing spent mixed ion exchange material from said bed and separating the same into anionic and cationic ion exchange material, removing the ionic pollutants from the separated spent anionic and cationic ion exchange material with anionic and cationic regenerant streams to regenerate the anionic and cationic ion exchange material and to form spent anionic and cationic regenerant streams, returning the regenerated



anionic and cationic exchange material to said bed, treating said spent cationic regenerant stream with a metal precipitant to form precipitated metal carbonates and recover the cationic regenerant stream for recycle to said spent cationic ion exchange material, and contacting said spent anionic regenerant stream with said precipitated metal carbonates at elevated temperatures to precipitate metal salts and recover metal precipitant for recycle to said spent cationic regenerant stream and anionic complexing agents for recycle to said spent anionic ion exchange material.

3,700,593

APPARATUS AND METHOD FOR REMOVING OIL PRODUCTS FLOATING ON WATER

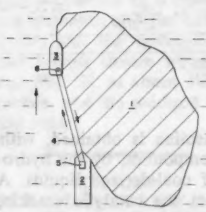
Cornelis Bezemer, Harco J. Tadema, and Jacob J. H. C. Houbolt, Rijswijk, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Continuation of abandoned application Ser. No. 753,695, Aug. 19, 1968. This application Dec. 21, 1970, Ser. No. 100,376

Claims priority application Great Britain, Sept. 18, 1967, 42,331/67

Int. Cl. B01d *15/00*

U.S. Cl. 210—40 **22 Claims**



An apparatus and method for removing oil slicks from a water surface wherein an elongated absorbent porous body is positioned along the water surface by base means

which include squeezers for removing oil from the body, a container for collecting the oil and drive means for moving the body past the squeezers.

3,700,594
CARBON DISULFIDE EMULSIONS
Kenneth J. Lissant, St. Louis, Mo., assignor to Petrolite Corporation, Wilmington, Del.
No Drawing. Filed Dec. 17, 1969, Ser. No. 886,016
Int. Cl. E21b *43/00*
U.S. Cl. 252—8.55 B 6 Claims

Non-Newtonian formulations containing carbon disulfide (CS_2) of reduced toxicity and flammability. These formulations are illustrated by high internal phase ratio (HIPR) emulsions containing carbon disulfide in the internal phase, said internal phase containing more than about 60% of the formulation by volume and preferably more than about 80% of the formulation by volume. These formulations are particularly useful in cleaning oil and gas wells by the removal of wax and/or sulfur.

3,700,595
FERROFLUID COMPOSITION
Robert Kaiser, Cambridge, Mass., assignor to Avco Corporation, Cincinnati, Ohio
No Drawing. Filed June 15, 1970, Ser. No. 46,556
Int. Cl. H01f *1/10*
U.S. Cl. 252—62.56 7 Claims

The present invention relates to a ferrofluid composition usable to control oil spills floating on open bodies of water. Such a process involves dispersing the present hydrocarbon base ferrofluid into the oil slick, then using a magnetic field to attract and pick up the oil. The same ferrofluid composition is also useful to separate water hydrocarbon oil emulsions.

3,700,596
PIEZOELECTRIC CERAMIC COMPOSITIONS
Fumio Naito, Toshiyuki Kudo, and Masanobu Kubosaki, Hirakata, Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi City, Osaka, Japan
Filed July 31, 1968, Ser. No. 748,993
Claims priority, application Japan, Aug. 1, 1967, 42/49,453
Int. Cl. C04b *35/46, 35/48, 35/50*
U.S. Cl. 252—62.9 3 Claims

A piezoelectric ceramic composition which consists essentially of the ternary solid solution

$$Pb[(Co_{1/3}, Nb_{2/3})_x, Zr_y, Ti_z]O_3$$

where $x+y+z=1$ and the composition lies within the area A-B-C-D-E-F of the triangular composition diagram of the drawing, wherein an oxide of tantalum or thorium is added with the range of from about 0.2 to about 1.0 weight percent of the composition to improve the electromechanical coupling coefficient and the mechanical quality factor of the composition.

3,700,597
DIELECTRIC COMPOSITIONS
Ernest L. Kastenbein, Rutherford, and Gerald L. Geltman, Wayne, N.J., assignors to Allied Chemical Corporation, New York, N.Y.
Filed Mar. 10, 1967, Ser. No. 622,242
Int. Cl. H01b *3/00, 3/02*
U.S. Cl. 252—63.2 2 Claims

This specification discloses methods of preparing solid dielectric compositions containing boron nitride by admixing suitable boron nitride particles of high purity with suitable particles of a thermoplastic resin and fabricating a solid article from this mixture using heat and pressure. The unusual properties of boron nitride, particularly its low dielectric constant and anisotropic thermal conductivity, are utilized to advantage and the problem of severe power factor variation upon exposure of boron nitride articles to moisture has been eliminated. At high boron nitride concentrations, the relative particle size of boron nitride and resin particles was found to be critical in order to obtain high strength, solid articles.

3,700,598
FUEL AND LUBRICATING OIL COMPOSITIONS
Larry Plonsker, Bloomfield Hills, Warren L. Perilstein, Orchard Lake, and Robert E. Malec, Birmingham, Mich., assignors to Ethyl Corporation, New York, N.Y.
No Drawing. Filed Nov. 16, 1970, Ser. No. 90,003
Int. Cl. C10l *1/22*; C10m *1/32*
U.S. Cl. 252—50 16 Claims

The dispersant and detergent properties of lubricating oils and liquid hydrocarbon fuels such as gasoline are improved by addition of a small but effective amount of an N-hydrocarbyl-substituted nitrilotris ethylamine. The hydrocarbyl group is preferably a polyolefin group, such as a polybutene group, having a molecular weight of from about 300 to 20,000, more preferably from 500 to 2,000.

3,700,599
COMPOSITION FOR MECHANICALLY CLEANING HARD SURFACES
Willam G. Mizuno and James L. Copeland, St. Paul, and Arlene E. Scholze, Burnsville, Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.
No Drawing. Filed Sept. 25, 1970, Ser. No. 75,676
Int. Cl. C11d *7/56*
U.S. Cl. 252—99 9 Claims

Detergent compositions for mechanically cleaning hard surfaces (e.g. dishes) are characterized by the presence therein of a mixture of metallic salt of citric acid (e.g. sodium citrate) and water soluble polymeric, organic polyelectrolyte (e.g. hydrolyzed maleic anhydride polymers). This mixture permits the reduction of or elimination of condensed phosphate salts commonly used in detergent compositions of this type (e.g. machine dishwashing detergents).

3,700,600
PROCESS OF PREPARING PULVERULENT TO GRANULAR PERBORATE CONTAINING WASHING COMPOSITIONS
Horstmar Nagel, Hilden, Markus Berg, Dusseldorf-Holthausen, Albrecht Lohr, Hosel, and Wilfried Adler, Hilden, Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany
No Drawing. Filed Oct. 8, 1970, Ser. No. 79,353
Claims priority, application Germany, Oct. 12, 1969, P 19 51 556.1; Dec. 20, 1969, P 19 63 898.3
Int. Cl. C11d *7/18, 7/56*
U.S. Cl. 252—99 8 Claims

Pulverulent to granular, perborate containing washing composition comprising

(a) From 5% to 40% by weight of anionic, and optionally amphoteric and non-ionic surface-active compounds with the proviso that any non-ionic surface-active compound present does not constitute more than 50% by weight of the total amount of surface-active compounds,

(b) From 7.5% to 50% by weight of a perborate whose water of crystallization is below that of a perborate tetrahydrate,

(c) From 15% to 80% by weight of compounds capable of complexing calcium ions and, optionally other alkaline builders,

(d) From 0 to 10% by weight of non-washactive compounds selected from the group consisting of neutral inorganic compounds and water, and

(e) From 0 to 10% by weight of other customary washing composition additives,

said composition being a mixture of at least two pulverulent components comprising

(A) a pulverulent component comprising (1) said anionic and any amphoteric and non-ionic surface-active compounds, (2) optionally present non-hydrolysable complex-formers, (3) not more than 20% by weight of hydrolysable complex-formers, and (4) other customary washing composition additives utilized in small amounts, said pulverulent component being prepared by drying with heat an aqueous suspension or slurry of the said components,

(B) said perborate component, and

(C) a pulverulent component comprising the remainder of the hydrolysable complex-formers and alkaline builders, if any. The process of producing the washing composition is also part of the invention.

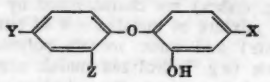
3,700,601

COLOR-STABLE LIQUID DETERGENT CONTAINING DISINFECTANTS

Helmut Blocking, Hilden, Germany, assignor to Henkel & Cie G.m.b.H., Dusseldorf, Germany

No Drawing. Filed Aug. 14, 1969, Ser. No. 850,228
Claims priority, application Germany, Sept. 11, 1968, P 17 92 513.2
Int. Cl. C11d *7/54, 3/48, 3/066*
U.S. Cl. 252—105 **12 Claims**

Color stable liquid detergents comprising 5 to 40 wt. percent of at least one anionic and/or non-ionic surfactant, 0.1 to 5 wt. percent of at least one substituted diphenyl ether having the formula:



wherein X, Y and Z are chlorine, with the proviso that Y can also be hydrogen, 0.01 to 5 wt. percent referred to the surfactant and disinfectant of at least one water soluble reducing agent and 0.001 to 2%, based on the total solids content present, of an optical brightener. The optical brightening action of said brighteners is not impaired by the presence of the substituted diphenyl ether disinfectant.

3,700,602

METHOD FOR MASS TAGGING SAND WITH A RADIOACTIVE ISOTOPE

Elick H. Acree and Forrest Neil Case, Oak Ridge, Tenn., and Nancy H. Stephens, Laurinburg, N.C., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Sept. 4, 1969, Ser. No. 855,390
Int. Cl. G21h *5/02*
U.S. Cl. 252—301.1 R **3 Claims**

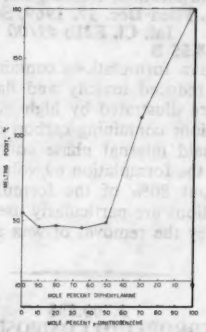
A procedure for tagging sand with ^{198}Au for use in the study of sediment transport involves precipitation of ^{198}Au directly onto the sand particles from an appropriate aqueous solution containing the radioisotope by means of a reaction with immiscible organic reducing agent such as p-isopropylbenzaldehyde. This process provides a radioisotope labeling technique in which the number of radiations detected per unit weight of sand is approximately proportional to the mass rather than being proportional to the surface area.

3,700,603

HEAT DETECTION AND COMPOSITIONS AND DEVICES THEREFOR

Alan Rembaum, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed June 25, 1969, Ser. No. 836,280
Int. Cl. C09d *11/00;* C09k *3/00, 11/12*
U.S. Cl. 252—408 **10 Claims**



Temperature change of a substrate such as a microelectronic component is sensed and detected by means of a mixture of a weak molecular complex of an electron donor compound such as an organic amine and an electron acceptor compound such as nitroaromatic compound. The mixture is encapsulated in a clear binder such as a vinyl resin.

3,700,604

ACID CATALYST SYSTEM FOR FURAN RESINS OF FILLER CONTAINING ACID SALTS

Ignatius Metil, Buffalo, N.Y., assignor to Ameron, Inc.

No Drawing. Filed May 5, 1969, Ser. No. 821,964
Int. Cl. B01j *11/82*
U.S. Cl. 252—428 **13 Claims**

Powdered acidic catalyst for furan resins is formed in situ on powdered inert filler material which may or may not contain a powdered cocatalyst dispersed therein. The acidic catalyst is a salt of a strong acid. In situ formation of the acidic salt is obtained by blending the acid and base into the filler, and uniform, homogenous dispersion of the salt is effected by blending one of them, as a liquid, into the filler whereafter the other is added, as a liquid, into the blend to produce a dry powder which is the acidic catalyst formed on and dispersed uniformly throughout the filler.

3,700,605

CATALYSTS

David Dodman, Kenneth William Pearson, and John Mathers Woolley, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,133
Claims priority, application Great Britain, Apr. 18, 1969, 19,974/69
Int. Cl. B01j *11/06*
U.S. Cl. 252—471 **3 Claims**

Manufacture of catalysts by contacting a manganese oxide precipitate containing bound alkali (especially a precipitate obtained by reduction of a permanganate with formaldehyde) with a salt of cobalt, copper, silver or lead, to replace the alkali by the heavy metal. Use of the catalysts in reducing nitro compounds to nitroso, azo, azoxy or amino compounds.

3,700,606

ELECTROCONDUCTIVE GLAZE AND METHOD FOR PREPARATION

Charles F. Parks, Grand Island, N.Y., assignor to Air Reduction Company, Incorporated, New York, N.Y.

No Drawing. Continuation of application Ser. No. 704,268, Feb. 9, 1968. This application Sept. 30, 1970, Ser. No. 76,971

Int. Cl. H01b *1/06*

U.S. Cl. 252—518 1 Claim

An alumina compatible electroconductive glaze composition comprising finely divided particles of thallium oxide dispersed in an at least partially devitrified solder glass matrix.

3,700,607

DETERGENT COMPOSITIONS CONTAINING N-OXIDE-AMINOCARBOXYLATES

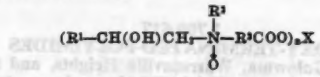
Bjorn Sundby, Piscataway, Edward J. Kenney, Bernardsville, and Harold E. Wixon, New Brunswick, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Nov. 28, 1969, Ser. No. 880,977

Int. Cl. C11d *1/84*

U.S. Cl. 252—527 21 Claims

Built synthetic organic detergent compositions comprise oxides of aminocarboxylates or aminocarboxylic acids of the formula:



wherein R^1 is an aliphatic hydrocarbon radical of 4 to 20 carbon atoms, R^2 is a hydrocarbon radical of 1 to 7 carbon atoms or is R^3COOX_m, R^3 is a divalent aliphatic or aromatic hydrocarbon radical of 1 to 9 carbon atoms, which may be the same as or different from any other R^3 radical in the compound, X is hydrogen, alkali metal, alkaline earth metal, other suitable salt-forming metal, ammonium, alkylamine or alkanolamine, which may be the same as or different from any other X in the formula, *m* is from ⅓ to 1 and *n* is from 1 to 3, both *m* and *n* being dependent on the valence(s) of X. In addition to the aminocarboxylate, such compositions comprise an inorganic builder salt, such as sodium tripolyphosphate or potassium pyrophosphate, and also may include other adjuvant materials, such as trisodium nitrilotriacetate, enzymes, anti-redeposition agents, bleaches or bluing agents, germicides, hydrotropes, auxiliary detergents and softening agents, etc. Usually, the aminocarboxylate comprises from 3 to 30% of the composition and the inorganic builder is from 10 to 70% thereof.

The products made may be in liquid or solid form, and are preferably employed as liquids or powders. They may be utilized as washing-softening agents in laundering or may be employed in pre-soaking or after-soaking of laundry, to improve the softening of the washed material. In some instances, the aminocarboxylate may be used without inorganic builder salt, in which cases it normally functions primarily as a softening agent and is preferably utilized after completion of washing.

3,700,608

PROCESS FOR PREPARING ALKYLENE OXIDE POLYMER

Katsuji Ueno and Takao Oshima, Osaka, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

No Drawing. Filed Jan. 7, 1971, Ser. No. 104,809

Claims priority, application Japan, Jan. 7, 1970, 45/2,628

Int. Cl. C08d

U.S. Cl. 260—2 A 10 Claims

A process for preparing alkylene oxide polymers or copolymers having high molecular weights comprising polymerizing at least an alkylene oxide in the presence of a ternary catalyst system comprising an organo-aluminum compound, an organo-zinc compound and an orthophosphoric acid is disclosed.

3,700,609

GRAFT COPOLYMERS

Geoffrey W. Tregear, North Clayton, Hendrik A. J. Battaerd, Nottinghill, Gunter A. Lang, Port Melbourne, Kevin Catt, Middle Park, and Hugh D. Niall, Armadale, Victoria, Australia, assignors to Imperial Chemical Industries of Australia and New Zealand Limited, Melbourne, Victoria, Australia

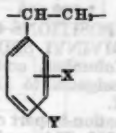
No Drawing. Continuation of abandoned application Ser. No. 628,818, Apr. 6, 1967. This application Feb. 1, 1971, Ser. No. 111,748

Claims priority, application Australia, Apr. 26, 1966, 4,671/66; Dec. 30, 1966, 16,002/66

Int. Cl. C08f *19/02, 41/04*

U.S. Cl. 260—2.5 R 28 Claims

A graft copolymer comprising a polymeric backbone and surface grafted on to it polymeric side-chains comprising a multiplicity of mer units of the formula



wherein X is at least one protein reactive group and Y stands for one or more optional substituents which is non-reactive with proteins. Processes of manufacture of the graft copolymer and its protein complexes are also described.

3,700,610

COPOLYMERS OF VINYLPYRIDINES WITH 1,3,5-TRIACRYLOYLHEXAHYDRO-1,3,5-TRIAZINE

Jacobo Zelik Zabicky-Zissman, Rehovoth, Ida Oren, Hasharon, and Ephraim Katchalski, Rehovoth, Israel, assignors to Yeda Research and Development Co. Ltd., Rehovoth, Israel

No Drawing. Filed Aug. 21, 1970, Ser. No. 66,150

Claims priority, application Israel, Aug. 28, 1969, 32,912

Int. Cl. C08f *19/00*

U.S. Cl. 260—2.1 E 9 Claims

Copolymers of vinylpyridines, which may be alkyl substituted, with 1,3,5-triacryloylhexahydro - 1,3,5 - triazine. These copolymers may be quaternized and utilized as ion exchangers. Alternatively, they are capable of complex formation with molecular halogen and may thus be utilized for the removal of elementary halogen from or its introduction into a desired medium.

3,700,611

POLYVINYL ALCOHOL-GLYOXAL-POLYOL ADHESIVE COMPOSITION

Ralph F. Nickerson and Harold D. Weymouth, Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 775,146, Nov. 12, 1968. This application Jan. 4, 1971, Ser. No. 103,914

The portion of the term of the patent subsequent to June 17, 1988, has been disclaimed

Int. Cl. C09j *3/16*

U.S. Cl. 260—17 R 16 Claims

Disclosed herein is an adhesive composition comprising (A) a polyvinyl alcohol resin, (B) glyoxal and (C) a polyol selected from the group consisting of cis 1,2-polyols and certain 1,3-polyols dispersed in an aqueous

medium. The adhesive compositions may contain minor amounts of adjuvants such as inert fillers or extenders, methyl cellulose, potassium tripolyphosphate, sodium acetate and mixtures thereof.

3,700,612

AQUEOUS SURFACE-COATING COMPOSITIONS CONTAINING HYDROXYALKYL ETHERS OF GALACTOMANNAN GUMS AS THICKENERS

Joseph Fath, Lebanon, and Marvin Rosen, Warren, N.J., assignors to Tenneco Chemicals, Inc.

No Drawing. Filed June 23, 1971, Ser. No. 156,050
Int. Cl. C08d *9/06*; C08g *5/20*
U.S. Cl. 260—17.4 ST 8 Claims

Aqueous surface-coating compositions that contain as thickener a hydroxyalkyl ether of a galactomannan gum having a degree of substitution of 0.10 to 3.0 are characterized by excellent flow and leveling characteristics, viscosity stability, and other valuable properties.

3,700,613

FILLED COMPOSITIONS CONTAINING 3,9-DIVINYL SPIROBI

David A. Berry, Columbus, and Gilbert M. Gynn, Hilliard, Ohio, assignors to Dart Industries, Inc., Los Angeles, Calif.

No Drawing. Continuation-in-part of application Ser. No. 843,815, July 22, 1969. This application July 15, 1971, Ser. No. 163,088
Int. Cl. C08f *45/18*
U.S. Cl. 260—17.4 CL 3 Claims

Compositions comprising 3,9-divinyl spirobi (meta dioxane) and a filler such as alpha cellulose, glass fibers, polyester fibers and mixtures thereof have excellent stain resistance and hardness. Such compositions find application in articles of manufacture including dinnerware.

3,700,614

HIGH IMPACT POLYPROPYLENE BLENDS

William F. Schenkerberg, Bogota, N.J., assignor to Dart Industries Inc., Los Angeles, Calif.

No Drawing. Filed May 7, 1971, Ser. No. 141,358
Int. Cl. C08f *19/14*, *21/04*
U.S. Cl. 260—23 H 10 Claims

The addition of finely divided particles of stearic acid coated calcium carbonate to blends of substantially crystalline polymers and copolymers of propylene and an elastomeric material results in a product having improved impact strength and improved flexural stiffness over the blends without the finely divided particles.

3,700,615

WASTE RUBBER DISPOSAL

Charles E. Scott, Yardley, Pa., assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed Dec. 11, 1970, Ser. No. 97,359
Int. Cl. C08d *13/38*
U.S. Cl. 260—2.3 1 Claim

Waste vulcanized rubber is depolymerized in a liquid hydrocarbon medium by means of agitation, heat, free-radical initiators, and molecular oxygen. The resulting solution of rubber-modified hydrocarbon can then be utilized in the manufacture of end-use products, thereby disposing of the waste rubber without pollution of the ecological environment. The rubber-modified hydrocarbon can, for instance, be vulcanized to produce a moisture barrier or insulation coating. It can also be mixed with asphalt to provide rubberized asphaltic compositions. In still another application, the rubber-modified hydrocarbon can be thermally decomposed to produce carbon black.

3,700,616

SCULPTURABLE MOLDING COMPOSITIONS

Thomas Zawadzki, Princeton, N.J., assignor to Paul F. O'Neil, Rumson, N.J.

No Drawing. Filed Dec. 3, 1969, Ser. No. 881,904
Int. Cl. C08f *45/38*, *45/40*
U.S. Cl. 260—31.6 R 4 Claims

Compositions comprising vinyl chloride and vinyl chloride copolymers, plasticizers, thixotropic agents and fillers are disclosed which are hand and tool workable like modeling clay, at room temperatures and form a hard, fused mass at elevated temperatures.

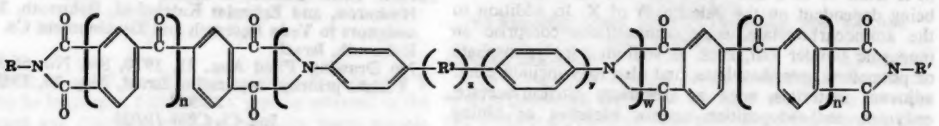
3,700,617

EPOXY-TERMINATED POLYIMIDES

Robert F. Golownia, Warrensville Heights, and Stanley Oswitch, University Heights, Ohio, assignors to Ferro Corporation, Cleveland, Ohio

No Drawing. Filed Sept. 22, 1969, Ser. No. 860,052
Int. Cl. C07d *27/52*
U.S. Cl. 260—326 C 6 Claims

Thermally stable epoxy terminated polyimides are employed with a fiber mat such as fiberglass to prepare thermosetting high temperature resistant laminates stable at temperatures as high at 600° F. The novel polyimides have the formula:



wherein R and R′ are propoxides, R^2 is SO_2, CH_2 or O and n, n', w, x and y are integers of from 0 to 1, providing that when x is 1, y is 1.

3,700,618

POLYAMIDES EXHIBITING IMPROVED FREEZE-THAW CHARACTERISTICS IN PRINTING INK COMPOSITIONS

Hubert Joseph Sharkey and Robert J. Sturwold, Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

No Drawing. Filed July 31, 1969, Ser. No. 846,611
Int. Cl. C08f *45/34*
U.S. Cl. 260—33.4 R 8 Claims

Poyamide resins exhibiting improved freeze-thaw characteristics in printing ink compositions comprise the reaction product of a diamine with a selected mixture of carboxylic acids comprising from about 20 to 90 equivalent percent of a polymeric carboxylic acid having an acid functionality of at least 3; from about 10 to 80 equivalent percent of a polymeric carboxylic acid having an acid functionality of about 2; in a ratio of the former polymeric

carboxylic acid to the latter polymeric carboxylic acid of from about 1:4 to 9:1; and from about 10 to 60 equivalent percent of a chain-stopping monocarboxylic acid.

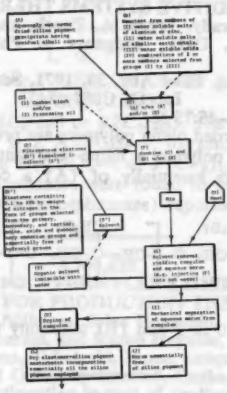
3,700,619

ELASTOMER-SILICA PIGMENT MASTERBATCHES AND PRODUCTION PROCESSES RELATING THERETO

Oliver W. Burke, Jr., Fort Lauderdale, Fla.
(1510 SW. 13th Court, Pompano Beach, Fla. 33061)

Continuation-in-part of applications Ser. No. 798,215 and Ser. No. 798,216, both Sept. 16, 1968, now abandoned, which are divisions of application Ser. No. 611,250, Jan. 24, 1967, now Patent No. 3,523,096, which in turn is a continuation-in-part of applications Ser. No. 458,379 and Ser. No. 458,420, both May 24, 1965, both now abandoned, and Ser. No. 479,806, Aug. 16, 1965, now Patent No. 3,401,017. This application July 16, 1970, Ser. No. 55,472

Int. Cl. C08c *11/10;* **C08k** *1/08*
U.S. Cl. 260—33.6 AO **9 Claims**



Curbing of silica pigment losses and the promotion of uniformity of product in the preparation of an elastomer-silica pigment masterbatch are effected (a) by combining (1) an aqueous slurry of hydrated silica pigment precipitate which has a bound alkali content, which has been prepared by precipitation from an aqueous alkali metal silicate solution, and which has been continuously kept in an aqueously wet state without having been dried after its precipitation—with or without addition in aqueous solution of (2) reactant selected from the members of Group (I) the water soluble salts of aluminum and zinc, Group (II) the water soluble salts of alkaline earth metals, Group (III) the water soluble acids and Group (IV) combinations of any two or more of the foregoing members—with (b) an organic solvent dispersion of elastomer consisting essentially of nitrogenous polymer containing 0.1 to 20% of nitrogen in the form of groups selected from the class consisting of amide primary, secondary and tertiary amine, and quaternary ammonium groups—with or without (3) carbon black and/or processing oil—and (b) removing the solvent and aqueous phase and recovering the resulting combination as a masterbatch. New products prepared by the process are also claimed.

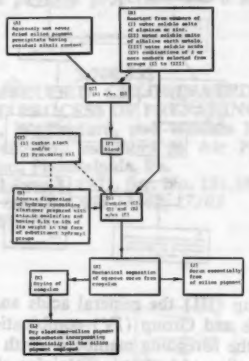
3,700,620

ELASTOMER-SILICA PIGMENT MASTERBATCHES AND PRODUCTION PROCESSES RELATING THERETO

Oliver W. Burke, Jr., Fort Lauderdale, Fla.
(1510 SW. 13th Court, Pompano Beach, Fla. 33061)

Continuation-in-part of application Ser. No. 798,216, Sept. 16, 1968, now abandoned, which is a division of application Ser. No. 611,250, Jan. 24, 1967, now Patent No. 3,523,096, which in turn is a continuation-in-part of applications Ser. No. 458,379 and Ser. No. 458,420, both May 24, 1965, both now abandoned, and Ser. No. 479,806, Aug. 16, 1965, now Patent No. 3,401,017. This application July 16, 1970, Ser. No. 55,487

Int. Cl. C08c *11/12;* **C08d** *9/00*
U.S. Cl. 260—33.6 AO **8 Claims**



Curbing of silica pigment losses and the promotion of uniformity of product in the preparation of an elastomer-silica pigment masterbatch is effected by (a) combining (1) an aqueous wet hydrated silica pigment precipitate which has a bound alkali content, which has been prepared by precipitation from an aqueous solution of alkali metal silicate, and which has been continuously maintained in an aqueously wet state without having been dried therefrom after its precipitation, with or without treatment with a selected reactant and (2) an aqueous dispersion of hydroxy containing elastomer and anionic dispersing agent, with or without (3) carbon black and/or processing oil, and (4) selected coagulant, and (b) recovering the resulting coagulum as a masterbatch, the steps prior to (b) having rendered the serum of the aqueous mixture essentially free of silica pigment. The product prepared by the process is a hydroxyl group containing elastomer-silica pigment masterbatch.

3,700,621

ELASTOMER-SILICA PIGMENT MASTERBATCHES AND PRODUCTION PROCESSES RELATING THERETO

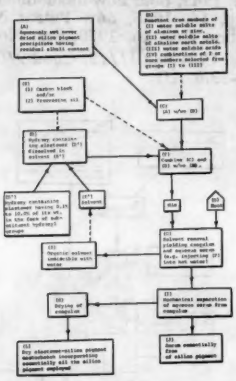
Oliver W. Burke, Jr., Fort Lauderdale, Fla.
(1510 SW. 13th Court, Pompano Beach, Fla. 33061)

Continuation-in-part of applications Ser. No. 798,215 and Ser. No. 798,216, both Sept. 16, 1968, now abandoned, which are divisions of application Ser. No. 611,250, Jan. 24, 1967, now Patent No. 3,523,096, which in turn is a continuation-in-part of applications Ser. No. 458,379 and Ser. No. 458,420, both May 24, 1965, both now abandoned, and Ser. No. 479,806, Aug. 16, 1965, now Patent No. 3,401,017. This application July 16, 1970, Ser. No. 55,488

Int. Cl. C08c *11/10;* **C08k** *1/08*
U.S. Cl. 260—33.6 AO **12 Claims**

Curbing of silica pigment losses and the promotion of uniformity of product in the preparation of an elastomer-

silica pigment masterbatch are effected (a) by combining (1) an aqueously wet hydrated silica pigment precipitate which has a bound alkali content, which has been prepared by precipitation from an aqueous alkali metal silicate solution, and which has been continuously maintained in an aqueously wet state without having been dried therefrom after its precipitation—with or without addition in aqueous solution of (2) reactant selected from the members of Group (I) the water soluble salts of aluminum and zinc, Group (II) the water soluble salts of alkaline earth



metals, Group (III) the mineral acids and water soluble organic acids and Group (IV) combinations of any two or more of the foregoing members—with (b) an organic solvent dispersion of hydroxy containing elastomer having from 0.1 to 10% of its weight consisting of substituent hydroxyl groups—with or without (3) carbon black and/or processing oil—and (b) removing the solvent and aqueous phase and recovering the resulting combination as a masterbatch containing essentially all of the silica pigment employed.

3,700,622

PROCESS FOR PREPARATION OF RUBBER MODIFIED STYRENE-ACRYLONITRILE POLYMERS

Joseph Francis Terenzi, Ridgefield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Dec. 21, 1970, Ser. No. 100,473
Int. Cl. C08f *15/42, 45/52*
U.S. Cl. 260—33.6 AO **5 Claims**

A process for the continuous production of rubber modified styrene-acrylonitrile polymers wherein styrene and acrylonitrile are copolymerized in the presence of an inert organic solvent and in at least two stages of polymerization, the resultant copolymer is charged with a grafted polybutadiene latex to a shearing zone at a specific temperature, pressure and time so as to produce a uniform composition having both a microscopic and macroscopic dispersion of ingredients and the resultant dispersion is devolatilized and extruded under specific conditions, and compositions of said ingredients, are disclosed.

3,700,623

REACTION PRODUCTS OF EPIHALOHYDRIN AND POLYMERS OF DIALLYLAMINE AND THEIR USE IN PAPER

Gerald I. Keim, West Grove, Pa., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 5,956, Jan. 26, 1970. This application Apr. 22, 1970, Ser. No. 30,986
Int. Cl. C08f *3/84, 13/06*
U.S. Cl. 260—80.3 R **12 Claims**

Water-soluble, alkaline curing resins which are the reaction products of an epihalohydrin and a polymer of a diallylamine are disclosed. The resins are particularly useful as wet strength agents for paper and additionally give superior dry strength to paper.

3,700,624

RESINOUS COMPOSITION

Toshio Adachi and Sayoko Funakisako, Osaka, Akio Furuya, Yokohama, and Masakatsu Uchida, Kamakura, Japan, assignors to Dai Nippon Toryo Co., Ltd., and Leben Utility Co. Ltd., both of Osaka-shi, Japan

No Drawing. Filed Apr. 28, 1971, Ser. No. 138,316
Claims priority, application Japan, Apr. 29, 1970, 45/37,073; June 16, 1970, 45/52,027; June 18, 1970, 45/53,139; July 24, 1970, 45/64,921
Int. Cl. C08f *45/36*
U.S. Cl. 260—31.6 **9 Claims**

A resinous composition comprising a vinyl chloride resin, an unsaturated polyester resin, a polymerization initiator, a reactive plasticizer, and optionally a non-reactive plasticizer and/or a vinyl monomer, and a molded article or film prepared from said composition, which is excellent in physical and chemical properties.

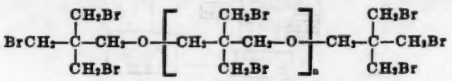
3,700,625

FLAME-RETARDED OLEFIN POLYMERS AND ADDITIVE SYSTEMS THEREFOR

Donnie G. Brady, Ernest A. Zuech, and Roy A. Gray, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Aug. 30, 1971, Ser. No. 176,259
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.75 R **5 Claims**

Flame-retarded olefin polymers are provided by admixing with the polymer a flame-retardant additive system which consists essentially of (A) a compound of the formula



wherein *n* is 0 to 5 and (B) antimony trioxide.

3,700,626

FLAME-RETARDED POLYMER COMPOSITIONS

Robert William Murray, Lebanon, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed May 20, 1970, Ser. No. 39,156
Int. Cl. C08f *45/60*
U.S. Cl. 260—45.8 R **10 Claims**

Flame-retarded compositions comprising a thermoplastic polymer and a flame-retarding amount of 1,1,4,4-tetrakis(2-cyanoethyl) - 1,4 - diphosphoniacyclohexane dibromide or diiodide, are disclosed.

3,700,627

DECOLORIZED POLYTETRAFLUOROETHYLENE

Henry C. Miller, Hatfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Filed May 25, 1970, Ser. No. 40,386
Int. Cl. C08f *45/56*
U.S. Cl. 260—45.85 **1 Claim**

Polytetrafluoroethylene film free of color is produced by adding metal salts to an aqueous polytetrafluoroethylene dispersion containing hydrocarbon surfactants, casting a film from the latex and sintering the film in air. The salts are added in 5 to 300 parts per million based on the weight of the latex.

3,700,628

BODY IMPLANTABLE ENCAPSULANT AND METHOD OF PREPARATION

William J. Dermody, Washington Crossing, N.J., and Alan E. Varker, Philadelphia, Pa., assignors to ESB Incorporated

No Drawing. Filed Feb. 8, 1971, Ser. No. 113,619
Int. Cl. A61n 1/36
U.S. Cl. 260—47 EN 10 Claims

A process is provided for encapsulating devices that may be implanted in the body without causing unfavorable reactions in and rejection by the body. An example of a device which may be encapsulated by the process is a heart pacer.

The process includes purification of the epoxy resin, preparation of an amine-epoxy hardener, and controlling the curing conditions of the mixture of hardener and resin.

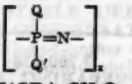
3,700,629

PHOSPHONITRILE ELASTOMERS

Kennard A. Reynard, Mentor, and Selwyn H. Rose, Beachwood, Ohio, assignors to Horizons Incorporated, a division of Horizons Research Incorporated

No Drawing. Filed Mar. 26, 1971, Ser. No. 128,496
Int. Cl. C08g 33/16
U.S. Cl. 260—47 P 10 Claims

Copolymers were prepared which contained the random repeat units



in which Q is either $F(CF_2)_pCH_2O$— or $H(CF_2)_pCH_2O$— and B is either RC_6H_4O or RZC_6H_4O. The value of p is not greater than 9; Z is —CH_2—, oxygen, NH or NR' and R and R' are $H(CH_2)_q$—, or $F(CF_2)_q$— where q is 0 to 5. These copolymers were found to be much more stable than the poly(phosphazenes) reported in the past.

3,700,630

MODIFIED POLYPHENYLENE OXIDE AND METHOD FOR PRODUCTION THEREOF

Takaki Hamada, Niihama, Seizo Nakashio, Nishinomiya, Isao Maruta, Ibaragi, and Kazuo Hayatsu, Tetsuki Seto, and Yoichi Kono, Takatsuki, Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

No Drawing. Continuation-in-part of application Ser. No. 845,066, July 25, 1969. This application Aug. 23, 1971, Ser. No. 174,138
Claims priority, application Japan, Aug. 8, 1968, 43/56,501
Int. Cl. C08g 23/20
U.S. Cl. 260—17.2 S 14 Claims

Modified polyphenylene oxides excellent in processability and moldability are obtained by graft-polymerizing on a polyphenylene oxide a styrene type compound or a mixture of the styrene type compound and an α-alkyl substitution product of said compound, in an aqueous dispersion containing an anionic or nonionic surfactant, a radical initiator and a solvent for the polyphenylene oxide.

3,700,631

METHOD FOR THE PRODUCTION OF ACRYLONITRILE POLYMERS AND COPOLYMERS

Francesco Siclari, Barlassina, Milan, Pietro Paolo Rossi, Garlasco, Pavia, and Seba Calgari and Roberto Jacuone, Cesano Maderno, Milan, Italy, assignors to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed July 23, 1969, Ser. No. 844,072
Int. Cl. C08f 3/76, 15/22
U.S. Cl. 260—85.5 7 Claims

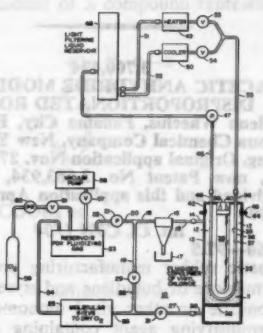
An improved method for polymerization or copolymerization of acrylonitrile is disclosed, of the kind in which the polymerization step is carried out within a polar organic solvent, wherein the catalyst system is of the so-called Redox type and comprises a peroxide, a reducing agent, a first metal, a second metal and a polymerization stopper which is soluble in the polar organic solvent. Also the metals or their compounds must be soluble in the organic polar solvent aforesaid. The metals are copper as a first metal and iron or cerium as the second metal. The stopper should also be a sequestering agent for metals. The preferred stoppers are some derivatives of ethylene diamino tetra acetic acid; a few of these derivatives, such as the nitrate, the chloride and the phosphate of EDTA have not yet been described heretofore in the technical literature. The advantage obtained with the method and the compounds of the invention is that acrylonitrile polymers and copolymers are obtained, which show improved physical properties and a highest whiteness rating.

3,700,632

READILY EXTRUDED CHLORINATED COPOLYMERS AND PROCESS OF PREPARING SAME

John H. Beale, Wallingford, and William Mayo Smith, Jr., Allentown, Pa., assignors to Air Products and Chemicals, Inc., Philadelphia, Pa.

Filed June 8, 1971, Ser. No. 151,100
Int. Cl. C08f 27/62, 27/03
U.S. Cl. 260—87.5 C 10 Claims



Postchlorinated copolymers of vinyl chloride and 2–10% by weight of either isobutylene or a vinyl ether have the advantageous combination of ready extrudability at 190° C. and a Vicat temperature of at least 100° C. The molecular weight of the resin selected as the starting material should be greater than about 10,000, and less than about 50,000, such range being also expressed by values of from about 150 to about 750 for the total number of C_2 groups in the polymer. The starting material can be represented by:

$$(CHClCH_2)_m(CQYCH_2)_n$$

in which $m+n=p$, in which n/p is in a range permitting 2–10% by weight of the comonomer. Y is methyl or hydrogen; Q is methyl if Y is methyl; Q is OR if Y is hydrogen, the R being an alkyl group having less than 20 carbon atoms, any chlorine substituents on the R or methyl groups not imparing the R or methyl terminology. The products can be represented as:

$$(CCl_2CH_2)_q(CHClCHCl)_r(CHClCH_2)_s(CQYCH_2)_t(CQYCHCl)_u$$

in which $q+r+s+t+u=v$ and v is about equal to p and within the 150–750 range. The Degree of Substitution is

0.3–0.8 so that s is $(0.7–0.2)m$ and t is usually more than $(0.7–0.2)n$. The combination of ready moldability at 190° C. and a Vicat temperature of at least 100° C. is attributed to the relatively large ratio of r/q, possibly resulting from the directive influence of $CQYCH_2$ upon the chlorination of $CHClCH_2$, the bulkiness of the Q and Y tending to promote formation of higher than random proportions of CHClCHCl groups during the postchlorination.

3,700,633
SELECTIVELY HYDROGENATED BLOCK COPOLYMERS

Milton M. Wald, Walnut Creek, Calif., and Myron G. Quam, deceased; said Wald assignor to Shell Oil Company, Houston, Tex.

No Drawing. Continuation-in-part of application Ser. No. 806,763, Dec. 24, 1968, which is a continuation-in-part of abandoned application Ser. No. 333,671, Dec. 26, 1963. This application May 5, 1971, Ser. No. 140,612 (Filed under Rule 47(a) and 35 U.S.C. 116)
Int. Cl. C08f *19/06, 19/08*
U.S. Cl. 260—880 B **5 Claims**

Block copolymers having low melt viscosity and improved processability comprise selectively hydrogenated block copolymers comprising A and B, non-elastomeric block A being substantially non-hydrogenated homopolymer blocks of mono alpha alkenyl arenes and elastomeric blocks B being random copolymer blocks of mono alpha alkenyl arenes and conjugated dienes wherein at least 90% of the aliphatic double bonds are hydrogenated.

3,700,634
ACETIC ANHYDRIDE MODIFIED DISPROPORTIONATED ROSIN

Charles Glenn Wheelus, Panama City, Fla., assignor to Arizona Chemical Company, New York, N.Y.

No Drawing. Original application Nov. 27, 1968, Ser. No. 779,600, now Patent No. 3,583,934, dated June 8, 1971. Divided and this application Apr. 24, 1970, Ser. No. 31,804
Int. Cl. C09f *1/04*
U.S. Cl. 260—97.5 **2 Claims**

In synthetic rubber manufacturing processes wherein aqueous emulsions of butadiene and styrene or butadiene and acrylonitrile or other vinyl monomer are prepared with an emulsifying agent containing a water-soluble soap of a disproportionated rosin and are polymerized in the presence of a free radical catalyst system, the adverse action of free oxygen on the polymerization is offset by heat-modifying the disproportionated rosin before it is converted into its soap. This is done by heating it at about 250°–300° C. for about 1 to 4 hours in admixture with about 0.5% to 5% of its weight of acetic anhydride.

3,700,635
POLYMERS OF N-[TRIS(HYDROXYMETHYL) METHYL]ACRYLAMIDE

David Philip Brust, Louis Morton Minsk, and Edward Peter Abel, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original application Apr. 2, 1969, Ser. No. 812,882. Divided and this application Feb. 16, 1971, Ser. No. 115,723
Int. Cl. C08f *15/02*
U.S. Cl. 260—80.3 N **3 Claims**

Photographic silver halide compositions and elements having improved covering power and sensitometric properties, obtained by employing polymeric additives in a photographic binder are disclosed. Said polymers comprise recurring N-[tris(hydroxymethyl)methyl] acrylamide units. Processes for effecting said improved properties and novel polymers are also disclosed.

3,700,636
2-METHYL-5-VINYLTETRAZOLE: ACRYLIC ESTER: ACRYLIC ACID POLYMERS

Hermann S. Haiss, Indian Head, and James U. Lowe, Jr., Landover, Md., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Dec. 26, 1967, Ser. No. 694,031
Int. Cl. C08f *17/00*
U.S. Cl. 260—80.72 **3 Claims**

A terpolymer of 2-methyl-5-vinyltetrazole/acrylic ester/acrylic acid and a method of preparing it by reacting 2-methyl-5-vinyl tetrazole acrylic acid and an acrylate in the presence of a chain transfer agent. The resulting composition provides a new fuel binder composition for propellant formulations and also a new gumstock composition.

3,700,637
DIENE-NITRILE RUBBERS

Albert M. T. Finch, Jr., Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 689,274, Dec. 11, 1967. This application May 8, 1970, Ser. No. 35,874
Int. Cl. C08f *27/25*; C08d *5/00*
U.S. Cl. 260—83.3 **7 Claims**

Substantially alternating copolymers of conjugated dienes and unsaturated nitriles, and their hydrogenated derivatives, are useful rubbers having high strength without vulcanization.

3,700,638
PROCESS FOR PREPARING ALTERNATING COPOLYMER OF BUTADIENE AND α-OLEFINE

Akiharo Kawasaki and Isao Maruyama, Ichihara, Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

No Drawing. Filed Apr. 17, 1970, Ser. No. 29,678
Claims priority, application Japan, Apr. 25, 1969, 44/31,429; May 13, 1969, 44/36,162; June 19, 1969, 44/47,918; July 3, 1969, 44/52,149; Aug. 15, 1969, 44/64,143; Sept. 10, 1969, 44/71,260; Sept. 25, 1969, 44/75,828; Sept. 30, 1969, 44/77,410, 44/77,411; Oct. 9, 1969, 44/80,281; Oct. 31, 169, 44/86,898, 44/86,899; Dec. 4, 1969, 44/96,888; Mar. 17, 1970, 45/21,993
Int. Cl. C08f *19/08*; C08d *1/14, 3/02*
U.S. Cl. 260—84.1 **8 Claims**

A process for preparing an alternating copolymer of butadiene and α-olefine having the formula of $CH_2{=}CHR$, wherein R represents phenyl or a normal or branched chain lower alkyl radical, which comprises contacting butadiene and the α-olefine in liquid phase with a catalyst system of an organoaluminum compound, a vanadium compound having V–X linkage (X is halogen) and a compound having M–OR linkage, M is an atom whose electro negativity is lower than 2.2 and R is a hydrocarbon radical of alkyl, aryl, cycloalkyl or halogenated ether radical or a compound having $(O—M)_x—(O—M')_y—OR$ linkage (M is defined as above and M′ can be defined by the same definition given in M). Optionally, a halogen atom, a halogen containing compound, a metal oxide or a metalloid oxide can be added to the catalyst system.

3,700,639
CRYSTALLINE POLYSTYRENE PRODUCTS

George E. Hulse and James J. Harris, Pittsburgh, Pa., assignors to Sinclair-Koppers Company

Filed Dec. 22, 1971, Ser. No. 210,832
Int. Cl. C08f *15/40, 19/04, 27/26*
U.S. Cl. 260—88.2 C **4 Claims**

Highly crystalline, isotactic polystyrene products having molecular weight of less than 1,000,000 are prepared by the thermal degradation in air at temperatures between 100° C. and 260° C. of high molecular weight, highly crystalline copolymers of styrene with 2–20 percent by

weight of an alpha-olefin having 3 to 10 carbon atoms. The initial copolymers have a molecular weight in excess of 1,000,000. The rate of degradation of the copolymers of this invention is greater than the rate of degradation of polystyrene at the same temperatures. The crystallinity of the resulting polystyrene product is generally higher than that of the initial copolymers.

3,700,640

MANUFACTURE OF AROMATIC FORMALDEHYDE RESINS

Harry E. Cier, Baytown, Tex., assignor to Esso Research and Engineering Company

Continuation-in-part of abandoned application Ser. No. 757,046, Sept. 3, 1968. This application Dec. 9, 1970, Ser. No. 96,571

Int. Cl. C08g 7/00

U.S. Cl. 260—67 A 6 Claims

Aromatic-formaldehyde resins of controlled oxygen content and viscosity are produced by reacting xylenes and formaldehyde under selected conditions of H_2SO_4 catalyst strength, acid:oil ratio, oil residence time, and selected temperatures.

3,700,641

PRODUCTION OF STABLE UREA, FORMALDEHYDE, POLYAMINE CONDENSATION PRODUCTS

Karl-Heinz Jung and Klaus-Gunther Gartner, Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft

No Drawing. Continuation-in-part of application Ser. No. 64,010, July 17, 1970, which is a continuation-in-part of abandoned application Ser. No. 667,332, Sept. 11, 1967. This application Apr. 8, 1971, Ser. No. 132,564

Claims priority, application Germany, Sept. 10, 1966, D 51 07 439

Int. Cl. C08g 9/10

U.S. Cl. 260—70 R 4 Claims

Condensation product of urea, formaldehyde and at least two different polyamines of the formula

$$H_2N—[CH_2—CH_2—NH]_{1-5}H$$

in mole ratio of 1:2 to 2.8:0.1 to 0.2 respectively at 70 to 100° C.; and acidifying to a pH of 4.0 to 4.5, and then at a pH of about 4 to 6. Product has good solution stability and paper impregnated therewith has improved wet strength.

3,700,642

POLYESTER-POLYOXYALKYLENE SULFONATE COMPOSITIONS

Masao Mizuno and Keishiro Igi, Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki City, Japan

No Drawing. Filed Dec. 2, 1970, Ser. No. 102,505

Claims priority, application Japan, Dec. 29, 1969, 45/45,824

Int. Cl. C08g 39/04

U.S. Cl. 260—75 S 16 Claims

Polyester compositions exhibiting improved dyeability and anti-static properties comprising an aromatic polyester and an effective amount of a polyoxyalkylene sulfonate represented by the formula:

$$(MO_3S)_lRO(AO)_mR'(SO_3M')_n$$

wherein A is an alkylene or aralkylene group; R and R' can be the same or different and are each selected from the group consisting of alkylene, arylene and alkarylene radicals; M and M' are alkali metals or alkaline earth metals; m is an integer greater than 3 and l and n are numbers which may be the same or different and which range from 0 to 2, inclusive, and satisfy the relationship that $l+n \geqq 1$.

3,700,643

RADIATION-CURABLE ACRYLATE-CAPPED POLYCAPROLACTONE COMPOSITIONS

Oliver Wendell Smith, South Charleston, W. Va., James Edward Weigel, White Plains, N.Y., and David John Trecker, South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 6,918, Jan. 29, 1970. This application Sept. 2, 1970, Ser. No. 69,127

Int. Cl. C08g 22/16, 17/02, 41/04

U.S. Cl. 260—77.5 AN 9 Claims

Unsaturated acrylate-capped polycaprolactone polyol derivatives are produced having terminal acrylyl groups and at least one polycaprolactone polyol chain residue in the molecule. In one of its simplest forms the final product can be the reaction product of a polycaprolactone diol an organic isocyanate and hydroxyethyl acrylate. These novel derivatives can be used to produce novel coating compositions that are readily cured to solid protective films.

3,700,644

DEEP DYEABLE COPOLYESTER RESINS

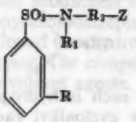
John A. Price, Swarthmore, and Mary J. Stewart, Media, Pa., assignors to FMC Corporation, Philadelphia, Pa.

No Drawing. Filed Mar. 31, 1971, Ser. No. 129,945

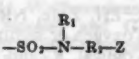
Int. Cl. C08g 17/08

U.S. Cl. 260—75 S 6 Claims

A copolyester resin product of (a) an aromatic dicarboxylic acid or its lower alkyl diester, (b) a glycol and (c) a minor amount of a compound represented by the formula



wherein R is —$COOR_3$ or



R_1 is a lower alkyl radical containing from 1 to 6 carbon atoms, R_2 is a C_2 to C_6 alkylene radical, R_3 is hydrogen or a lower alkyl radical containing from 1 to 6 carbon atoms, and Z is a hydroxyl or —$COOR_3$ radical.

3,700,645

PROCESS FOR PREPARING MERCAPTO-TERMINATED CHLOROPRENE COPOLYMERS

Ichiro Fukuoka and Satoshi Takahashi, Tokyo, and Norio Yagi, Kanagawa, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Mar. 16, 1971, Ser. No. 124,929

Claims priority, application Japan, Mar. 18, 1970, 45/22,473, 45/22,474

Int. Cl. C08g 22/00

U.S. Cl. 260—77.5 CR 12 Claims

Mercapto-terminated chloroprene - copolymer is prepared by the steps of dissolving a mixture of chloroprene monomer and a comparatively large amount of sulfur into organic solvent, copolymerizing said mixture by the solution polymerization method, and cleaving the obtained copolymer by the action of nascent state hydrogen in the solution.

The obtained copolymer is liquid at ambient temperature and can be easily cured using ordinary curing agents.

3,700,646

POLYFLUOROISOALKOXY-ALKYL SULFIDES AND POLYSULFIDES

Louis G. Anello, Orchard Park, and Richard F. Sweeney, Elma, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 119,957, Mar. 1, 1971. This application May 3, 1971, Ser. No. 139,944

Int. Cl. C07c *149/12*

U.S. Cl. 260—608 13 Claims

Novel sulfides and polysulfides of the formula

$$R_f—S_x—R'_f$$

wherein R_f and R'_f are polyfluoroisoalkoxyalkyl radicals and x is an integer 1 to 8. These novel compounds are useful as oxidation-resistant lubricants, additives to lubricants and cutting oils, and intermediates in the preparation of valuable surface active compounds.

3,700,647

ALTERNATING COPOLYMERS OF ALPHA-OLEFINS AND ACRYLIC COMPOUNDS

Kohei Nakaguchi, Shohachi Kawasumi, Masaaki Hirooka, and Hiroshi Yabuuchi, Niihama, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Original application Jan. 27, 1965, Ser. No. 428,531. Divided and this application Feb. 16, 1971, Ser. No. 115,874

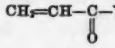
Claims priority, application Japan, Jan. 30, 1964, 39/4,401

Int. Cl. C08f *19/10, 15/18*

U.S. Cl. 260—63 R 41 Claims

Novel alternating copolymers of terminally unsaturated hydrocarbons of the formula

wherein R^1 and R^2 each is hydrogen or an alkyl, aryl aralkyl, alkylaryl or cycloalkyl radical and an acrylic compound of the formula



wherein Y is R, SR, ZH, ZMe, NR'R'', halogen or hydrogen in which Z is oxygen or sulfur, R is a hydrocarbon or halohydrocarbon radical, R' and R'' each is hydrogen or a hydrocarbon radical, Me is a metal or ammonium radical and their method of production comprising contacting the aforementioned monomers with an organoaluminum halide of the formula AlR'''_nX_{3-n} wherein R''' is a hydrocarbon radical, X is a halogen and n is 1, 1.5 or 2, said alternating copolymers being useful as molded products, films, fibers, calking compounds, coating materials, adhesives and the like.

3,700,648

METHOD FOR PRODUCING ALTERNATING COPOLYMERS

Masaaki Hirooka, Ibaragi-shi, Seimei Yasui and Kentaro Mashita, Takatsuki-shi, and Fumiyuki Kimura, Ibaragi-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed Sept. 15, 1969, Ser. No. 858,153

Claims priority, application Japan, Sept. 30, 1968, 43/70,976

Int. Cl. C08f *19/10, 15/18*

U.S. Cl. 260—63 R 13 Claims

Alternating copolymers are produced according to a process in which at least one group (A) monomer selected from a terminal unsaturated olefinic compound, an internal olefinic compound, a non-conjugated polyenic compound, an acetylenic compound and a carbonyl- or thiocarbonyl-containing non-conjugated, unsaturated compound, and at least one group (B) monomer, selected from conjugated vinyl and substituted vinyl compounds having nitrile or carbonyl groups at the position conjugated to the carbon-carbon double bond are copolymerized in the presence of a catalyst system prepared by mixing, in the presence of at least the above-mentioned group (B) monomer, a compound of a transition metal of Groups IV*a*, V*a*, VI*a* and VIII of the Mendeleef's Periodic Table which has at least one member selected from the group consisting of a halogen atom and alkoxy, β-diketo and acyloxy groups with an organo-aluminum or -boron halide, whereby the transition metal compound enhances the reaction carried out in the presence of an organo-aluminum or -boron halide.

3,700,649

POLYIMIDES OF BENZOPHENONE TETRACARBOXYLIC ACID ESTERS AND AROMATIC DIAMINES HAVING A BASICITY CONSTANT OF LESS THAN 10^{-9} AND METHOD OF PREPARATION

William R. Boram, San Diego, and Luis Acle, Jr., Sanford, Calif., assignors to International Harvester Company, San Diego, Calif.

No Drawing. Continuation-in-part of application Ser. No. 851,070, Aug. 18, 1969, which is a division of application Ser. No. 712,908, Mar. 14, 1968, now Patent No. 3,506,583. This application July 6, 1971, Ser. No. 160,102

Int. Cl. C08g *20/32*

U.S. Cl. 260—65 13 Claims

Monomeric, resinoid, solid state solutions of certain aromatic diamines in derivatives of benzophenonetetracarboxylic acid. Process for preparing such solutions and for converting them to polyimides and to polyamic acid precursors.

3,700,650

VULCANIZATION OF EPIHALOHYDRIN POLYMERS

Hiroshi Hani, Bunji Amemiya, Ginnosuke Tanaka, Hiroshi Kawahara, and Minoru Yamada, Kanagawa-ken, Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Filed June 5, 1970, Ser. No. 43,691

Claims priority, application Japan, June 12, 1969, 44/45,749; Sept. 5, 1969, 44/70,411; Oct. 14, 1969, 44/81,565; Oct. 28, 1969, 44/85,673; Dec. 9, 1969, 44/98,363

Int. Cl. C08g *23/00*

U.S. Cl. 260—79 6 Claims

Epihalohydrin polymers, or epihalohydrin polymer-sulfur curable rubber systems, are vulcanized in the presence of a novel cross-linking formulation consisting essentially of (1) at least one compound selected from the group consisting of nickel carbonates, basic lead sulfates, basic lead sulfites and dithiocarbamates of sodium, copper, calcium, cadmium, lead, antimony, bismuth, selenium, manganese, iron, cobalt and amines, and (2) at least one member selected from the group consisting of 2-mercaptoimidazolines and 2-mercaptopyrimidines, thioureas, polyamines, or in the presence of a novel cross-linking formulation consisting of (1), (2) and (3) sulfur, as the case may be.

3,700,651

L-LEUCYL-L-LEUCYL-L-VALYL-L-TYROSINOL

Yuichi Yamamura, Toyonaka, Tatsuo Kokubu, Osaka, Keisuke Shigezane, Urawa, and Tomishige Mizoguchi, Yamato-machi, Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

No Drawing. Filed July 7, 1970, Ser. No. 53,012

Claims priority, application Japan, July 15, 1969, 44/56,276

Int. Cl. C07c *103/52*

U.S. Cl. 260—112.5 2 Claims

L-leucyl-L-leucyl-L-valyl-L-tyrosinol and its pharmaceutically acceptable acid addition salts have antihyper-

tensive activity. An ester of L-leucyl-L-leucyl-L-valyl-L-tyrosine having a terminal-α-amino group which is either protected or unprotected is reduced. If the terminal α-amino group is protected, the protective group is then removed.

3,700,652

(4-L-THREONINE)-MESOTOCIN

Maurice Manning, Toledo, Ohio, assignor to The Medical College of Ohio at Toledo, Toledo, Ohio

No Drawing. Filed Aug. 31, 1970, Ser. No. 68,569
Int. Cl. C07c *103/52*
U.S. Cl. 260—112.5 1 Claim

A novel biologically active (4-L-threonine)-mesotocin which is an analog of mesotocin in which the glutamine residue in position four is replaced by a threonine residue.

3,700,653

DYE PREPARATIONS CONTAINING A METALLIZED DISAZO DYE AND MONOPROPANOLAMINE

Alfred Frei, Binningen, Basel-Land, and August Schweizer, Muttenz, Basel-Land, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz A.G.), Basel, Switzerland

No Drawing. Filed Oct. 29, 1968, Ser. No. 771,652
Claims priority, application Switzerland, Oct. 30, 1967, 15,207/67; Nov. 24, 1967, 16,573/67; Dec. 6, 1967, 17,060/67
Int. Cl. C09b *45/28*
U.S. Cl. 260—148 15 Claims

Stable, concentrated dye preparations containing one metallized dye of the azo or azomethine series and monopropanolamine or an aminothiole.

3,700,654

NAD SALTS AND METHODS OF PREPARATION

Donald R. Brusca, Bainbridge Island, Wash., assignor to Enzomedic Laboratories, Inc., Seattle, Wash.

No Drawing. Continuation-in-part of application Ser. No. 619,935, Mar. 2, 1967. This application May 19, 1969, Ser. No. 825,917
Int. Cl. C07d *51/54*
U.S. Cl. 260—211.5 R 3 Claims

Neutral, solid salts of nicotinamide adenine dinucleotide are produced as a physiologically acceptable and stable form of the coenzyme. The salts are useful in the treatment of alcoholism, drug addiction, ileus and shock associated therewith, schizophrenia, and rheumatoid arthritis.

3,700,655

ANTIBIOTICS OF AGRICULTURAL FUNGICIDES, POLYOXINS A AND B; AND PROCESS FOR PREPARING THE SAME

Saburo Suzuki, Kiyoshi Isono, and Junsaku Nagatsu, Tokyo, and Takeo Akashiba and Shigeki Sasaki, Kanagawa-ken, Japan, assignors to Rikagaku Kenkyusho, Yamato-machi, Kitaadachi-gun, Saitama-ken, Japan

Continuation-in-part of application Ser. No. 490,001, Sept. 24, 1965. This application July 12, 1968, Ser. No. 744,455
Claims priority, application Japan, Sept. 24, 1964, 39/54,088
Int. Cl. A61k *21/00*
U.S. Cl. 260—211.5 17 Claims

Polyoxins A and B are each a novel antibiotic to be used as an agricultural fungicide for the protection of plants.

Said polyoxins A and B are prepared by collecting polyoxin complex containing polyoxins A and B from a culture medium in which has been cultivated a novel strain of *Streptomyces cacaoi* var. *asoensis* that is a mutant of *Streptomyces cacaoi* and is on deposit with the American Type Culture Collection (ATCC) in an unrestricted deposit as ATCC access numbers 19093 and 19094, and then separating said complex into each of polyoxins A and B.

3,700,656

PROCESS FOR THE PREPARATION OF LACTAMS

Mitsuo Masaki, Chiba, and Kiyoshi Fukui, Tetsuro Kuramasu, and Masahiro Ueda, Ichihara, Japan, assignors to Ube Industries, Ltd., Yamaguchi-ken, Japan

Filed Aug. 25, 1970, Ser. No. 66,768
Claims priority, application Japan, Aug. 29, 1969, 44/67,957; Sept. 1, 1969, 44/68,631
Int. Cl. C07d *41/06*
U.S. Cl. 260—239.3 A 8 Claims

A process for the preparation of lactams, which comprises treating a lactam-stannic halide complex with an alicyclic ketoxime to form the corresponding lactam and alicyclic ketoxime-stannic halide complex.

3,700,657

TETRAHYDROPYRAZOLODIAZEPINONE COMPOUNDS AND METHODS FOR THEIR PRODUCTION

Ivan C. Nordin, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

No Drawing. Filed May 18, 1971, Ser. No. 144,628
Int. Cl. C07d *53/02*
U.S. Cl. 260—239.3 B 6 Claims

3 - methyl - 4,6,7,8 - tetrahydropyrazolo[4,3-e][1,4]-diazepin-5(1H)-one, substituted in the 1-position by lower alkyl and optionally in the 4- and 7-positions by methyl; salts thereof; and their production by catalytically hydrogenating a dihydropyrazolodiazepinone, or by reacting one of the 7-unsubstituted tetrahydropyrazolodiazepinones with a methylating agent. The compounds of the invention are useful as anticonvulsant agents.

3,700,658

N-ALKYL-N-ARYLCARBAMOYL LACTAMS

Adolf Steinhofer, 11 Wolframstrasse; Helmut Doerfel, 7 Edenkobener Strasse; and Georg Falkenstein, 6 Hafenstrasse, all of 6700 Ludwigshafen, Germany; and Wolfgang-Dieter Jeserich, 25 Eulenweg, 6715 Lambscheim, Germany

No Drawing. Original application July 3, 1968, Ser. No. 742,142. Divided and this application Sept. 25, 1970, Ser. No. 75,721
Claims priority, application Germany, July 5, 1967, P 17 20 280.1
Int. Cl. C07d *41/06*
U.S. Cl. 260—239.3 R 4 Claims

New N-alkyl-N-arylcarbamoyl lactams which are suitable as activators for the anionic polymerization of lactams.

3,700,659

(+)-CIS - 1,3-DIBENZYL-HEXAHYDRO-1H-FURO-[3,4-d]IMIDAZOLE - 2,4 - DIONE, PROCESSES AND INTERMEDIATES

Max Gerecke, Reinach, Switzerland, and Jean Pierre Zimmermann, St. Louis, France, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Nov. 17, 1970, Ser. No. 90,478
Int. Cl. C07c *173/10*; C07d *99/04*
U.S. Cl. 260—239.5 11 Claims

(+)-Cis-1,3-dibenzyl - hexahydro - 1H - furo[3,4-d]-imidazole-2,4-dione, prepared starting with cis-1,3-dibenzyl-hexahydro-1H-furo[3,4-d]-imidazole - 2,4,6- - trione, is described. The end product is a valuable intermediate in the synthesis of (+)-biotin, as well as derivatives and related products thereof.

3,700,660
CATALYTIC PREPARATION OF 17α-ACYLOXY-20-KETO-STEROIDS

Gerhard Hempel, Bergkamen, Reinhold Wieske, Berlin, Bernhard Krieger, Bergkamen, and Emanuel Kaspar, Kamen, Germany, assignors to Schering AG, Berlin, Germany

No Drawing. Filed Oct. 1, 1969, Ser. No. 862,946
Claims priority, application Germany, Oct. 2, 1968, P 18 01 389.3; July 31, 1969, P 19 39 607.4
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 **12 Claims**

A process for the preparation of a 17α-acyloxy-20-keto-steroid of the pregnane or 19-norpregnane series, said process comprising the step of catalytically converting the corresponding 20-acyloxy - 17α,20 - epoxy-steroid with a catalytically effective amount of a concentrated strong acid such as perchloric acid, H_2SO_4, BF_3, HCl, p-toluene sulfonic acid and the like. The final products have the known activities associated with steroids of the pregnane and 19-nor-pregnane series, e.g., progestational, anti-inflammatory, etc.

3,700,661
TOTAL STEROID SYNTHESIS EMPLOYING SUBSTITUTED ISOXAZOLE DERIVATIVES

Gabriel Saucy, Essex Fells, and John William Scott, Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Nov. 22, 1968, Ser. No. 778,314
Int. Cl. C07d *85/22*
U.S. Cl. 260—240 E **22 Claims**

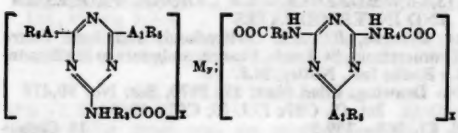
The novel intermediates and processes of this invention provide a new synthetic route for the preparation of pharmaceutically valuable 19-nor-steroids. Further, the intermediates and processes of the invention provide a novel route for the preparation of pharmaceutically valuable estrones. The present invention provides a facile total synthesis of 13β-alkyl-C/D-trans-steroidal materials. This desirable result is obtained via a unique asymmetric induction followed by subsequent stereo-specific reaction steps. As a precursor to the steroidal Ring A, a 3,5-disubstituted-4-isoxazolylmethylene group is employed in this synthesis.

3,700,662
TRIAZINE DERIVATIVES AND COMPOSITIONS THEREOF

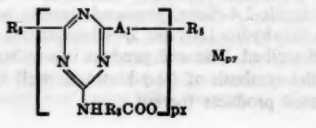
Tatsuo Ishikawa, 6–3 Kitashinkoji; Shiro Hiruta, 4770 Yamatsukicho; Teruomi Wakabayashi, 1 Sakurazonocho; Yoshihiko Inamoto, 3–1 Nakagawaracho-2-chome; Tetsuhiro Kusunose, 4850 Nakagawaracho-2-chome; Tatsuichi Tsumaki, 4920 Nakagawarachi-2-chome; and Masami Ota, 4993–374 Shimonagahamacho, all of Nobeokashi, Japan

Filed Aug. 28, 1968, Ser. No. 755,875
Int. Cl. C07d *55/18, 55/20*
U.S. Cl. 260—242 **4 Claims**

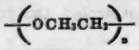
Triazine derivatives represented by any one of the following formulae:



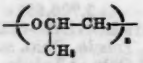
and



wherein, A_1 and A_2 are same or different and each denotes a polyalkylene oxide selected from the group consisting of polyethylene oxide

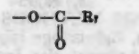


polypropylene oxide

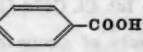


and polyethylene oxide-polypropylene oxide copolymer

wherein n is an integer of 1 to 200 and $m+n$ is an integer of 2 to 200 (m and $n \geqq 1$); R_3 and R_4 are same or different and each denotes a member selected from the group consisting of alkylene of 1 to 12 carbon atoms, o- and p-cyclohexylene, o- and p-methylene cyclohexylene, o- and p-phenylene, and o- and p-methylene phenylene; M denotes a member selected from the group consisting of hydrogen, a metal selected from the group consisting of calcium, barium, magnesium, tin, aluminum, copper, potassium sodium, zinc, manganese, nickel, strontium and cadmium, and an organic amine selected from the group consisting of mono-, di- and tri-ethanol amines, and primary, secondary and tertiary amines of 1 to 17 carbon atoms; x and y each denotes an integer of 1 to 4 depending on the valency of the metal; p is an integer of 2 to 5; and R_5 and R_6 are same or different and each denotes a member selected from the group consisting of hydroxy, alkoxy of 1 to 10 carbon atoms, naphthoxy, benzoxy, secondary amino of 1 to 17 carbon atoms, and



wherein R_7 denotes a member selected from the group consisting of alkyl of 1 to 17 carbon atoms, phenyl, p-carboxy phenyl



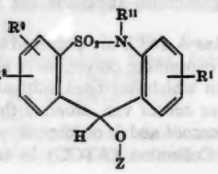
and naphthyl prepared by alcohol interchange reaction between sodium or potassium salt of di-(or mono)alkoxy-mono - (or di-respectively)-ω-aminoacid-syn-triazine and polyalkylene glycol or derivative thereof, are superior antistatic agents for polymer materials such as polyamides, polyesters, polyolefines, polystyrene, polyvinyl chloride, polyvinylidene chloride, polymethylmethacrylate, polyacrylonitrile butadiene styrene terpolymer.

3,700,663
DIBENZOTHIAZEPINE ETHERS

Abraham Weber, Paris, and Jacques Jean Frossard, Champigny, France, assignors to Mead Johnson & Company, Evansville, Ind.

No Drawing. Original application Aug. 2, 1967, Ser. No. 657,785, now Patent No. 3,519,633, dated July 7, 1970. Divided and this application Mar. 18, 1970, Ser. No. 24,971
Int. Cl. C07d *93/42*
U.S. Cl. 260—243 B **8 Claims**

Novel compounds of Formula I having antihistaminic and other pharmacological activity.



Formula I

3,700,664

PREPARATION OF THIONAMIDES

Mikhail M. Girgis, Guelph, Ontario, Canada, assignor to Uniroyal, Ltd., Montreal, Quebec, Canada

No Drawing. Filed Mar. 26, 1970, Ser. No. 23,063

Int. Cl. C07d *87/46*

U.S. Cl. 260—247.1 10 Claims

Thionamides are formed in high yield by reacting alkyl, aryl, heterocyclic nitriles, or phenylacetonitriles and hydrogen sulfide under pressure in the presence of a minimal amount of basic catalyst. The use of a minimal amount of catalyst prevents the reverse decomposition of the thionamide to nitrile and hydrogen sulfide.

3,700,665

DIAMINO-s-TRIAZINES

Raymond Seltzer, New York, and David A. Gordon, Scarsdale, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Oct. 31, 1969, Ser. No. 873,110

Int. Cl. C07d *55/50*

U.S. Cl. 260—248 CS 6 Claims

Amine-s-triazines, such as 2-phenyl-4,6-bis(4-aminophenyl)-s-triazine, are useful in preparing triazine-based polyimide polymers. These compounds are prepared by reacting a cyano alkyl or aryl nitro compound and an acid chloride in the presence of a Friedel-Crafts catalyst followed by a reduction of an intermediate dinitro compound.

3,700,666

TRIAZINE DERIVATIVES OF THIOBISPHENOLS AND PROCESS OF PREPARATION

Michael Robin, Colonia, and Sheldon R. Schulte, Highland Park, N.J., assignors to Ashland Oil & Refining Company, Houston, Tex.

No Drawing. Filed Dec. 16, 1969, Ser. No. 885,633

Int. Cl. C07d *55/50*

U.S. Cl. 260—248 CS 8 Claims

Reaction products of a triazine compound such as a cyanuric halide and a hindered thiobisphenol are obtained. Such products are useful as antioxidants and ultraviolet stabilizers in various compositions and materials.

3,700,667

METHOD FOR MANUFACTURING PURIFIED ISOCYANURATES

Hisao Kitano, 1–6–205, 3-chome, Harima-cho, Abeno-ku, Osaka, Japan, and Fumio Tanimoto, 275 Tenjinyamacho, Shinmachi-Higashiiru, Nishikikoji-dori, Kyoto, Japan

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,939

Claims priority, application Japan, Mar. 2, 1970, 45/18,095

Int. Cl. C01d *55/38*

U.S. Cl. 260—248 NS 23 Claims

A method for manufacturing purified isocyanurates, comprising contacting crude isocyanurates containing 0.01 to 10.00% by weight of impurities with a basic solution containing at least 5% by weight of a nitrogen compound having from 0 to 4 of carbon atoms at a temperature between 20 and 200° C. and under a pressure between 1.5 and 30 kg./cm.^{2}.

3,700,668

2-(3,4,4-TRIFLUORO-3-BUTENYLTHIO)-4,4,6-TRIMETHYLDIHYDROPYRIMIDINE

Mervin E. Brokke, Richmond, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Application Nov. 20, 1969, Ser. No. 877,539, now Patent No. 3,654,293, which is a division of application Ser. No. 490,664, Sept. 27, 1965, now Patent No. 3,513,172. Divided and this application May 27, 1971, Ser. No. 147,705

Int. Cl. C07d *51/34*

U.S. Cl. 260—251 R 1 Claim

The compound 2-(3,4,4-trifluoro-2-butenylthio)-4,4,6-trimethyldihydropyrimidine, useful as a nematocide.

3,700,669

SEPARATION AND PURIFICATION PROCESS FOR LACTAMS

Shigeru Wakamatsu, Nagoya, Ryozo Kondo, Anjoshi, Aichi, and Masayasu Shinomiya, Nagoya, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

No Drawing. Filed Oct. 31, 1968, Ser. No. 772,369

Claims priority, application Japan, Oct. 31, 1967, 42/69,788

Int. Cl. C07d *41/06*

U.S. Cl. 260—239.3 9 Claims

By extracting a lactam-containing reaction mixture obtained from the Beckmann rearrangement reaction of a cyclic ketoxime in the presence of water with liquid sulfur dioxide, the lactam can be effectively separated in the pure state.

3,700,670

PROCESS FOR MAKING Δ^5 (10)-ESTRENES OR PREGNENES AND PRODUCTS OBTAINED THEREBY

Hans Detlef Berndt and Rudolf Wiechert, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

No Drawing. Continuation-in-part of application Ser. No. 763,934, Sept. 30, 1968. This application Mar. 20, 1970, Ser. No. 26,187

Claims priority, application Germany, Mar. 20, 1969, P 19 14 898.2

Int. Cl. C07c *173/00, 169/20*

U.S. Cl. 260—239.55 R 9 Claims

Method of preparing 3β-hydroxy-$\Delta^{5(10)}$-estrenes or 19-nor-pregnenes by catalytically reducing a corresponding 3-keto-$\Delta^{5(10)}$-steroid under a pressure of at least 10 atmospheres and at normal pressure when active Raney nickel is used as catalyst. The process permits obtaining a high yield of the 3β-hydroxy compositions which are important for the synthesis of 10β-methyl-androstanes and pregnanes.

3,700,671

CHELATING COMPOSITIONS

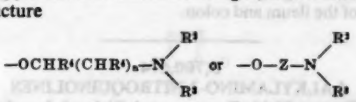
Gaetano F. D'Alelio, South Bend, Ind., assignor to Walter J. Monacelli, Petersburg, Fla.

No Drawing. Original application May 15, 1967, Ser. No. 638,654. Divided and this application Dec. 30, 1968, Ser. No. 804,036

Int. Cl. C07d *55/50*

U.S. Cl. 260—248 7 Claims

Triazine compounds are disclosed which are derivatives of symmetrical triazine having 1, 2 or 3 radicals of the structure

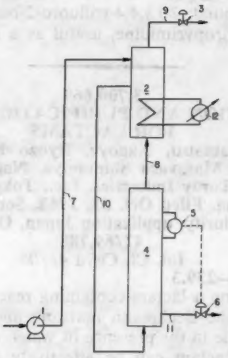


there being at least one metal coordinating group of the structure —CHR^{4}COOM, wherein M, Z, R^2, R^3 and R^4 are as defined hereinafter. These compounds are useful for coordinating with and removing metals from solutions or for preparing resins capable of removing metals from solutions.

3,700,672
PROCESS FOR RECOVERING BY-PRODUCT GASES AT HIGH PRESSURE IN MELAMINE PRODUCTION

Ryo Kokubo; Yasuo Takakuwa; Akihiro Shiroishi, and Mitsuji Kihara, all of Fuchumachi, Neigun, Japan, assignors to Nissan Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed April 15, 1969, Ser. No. 816,331
Int. Cl. C07d 55/24
U.S. Cl. 260—249.7 P 8 Claims



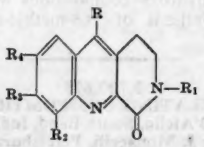
In the process of producing melamine by the thermal decomposition of urea or its derivatives, an improved method for separating the molten material (composed mainly of melamine formed in a pressurized reactor) from the gases (composed mainly of ammonia and carbon dioxide) under nearly the same conditions as prevail in said reactor, and for recovering the by-product gases as pressurized by-product gases, with the crude liquid melamine eliminated therefrom.

3,700,673
3-4-DIHYDROBENZO(B) (1,7)NAPHTHYRIDIN-1(2H)-ONES

Edward John Watson, Jr., West Chester, Pa., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Feb. 12, 1971, Ser. No. 115,042
Int. Cl. C07d 39/00
U.S. Cl. 260—287 R 14 Claims

Compounds of the formula:



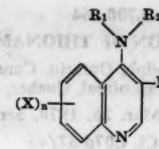
wherein R is hydroxy, phenoxy, chloro, amino, or di(lower)alkylamino (lower)alkylamino; R_1 is hydrogen or acetyl; R_2 is hydrogen or methoxy; R_3 is hydrogen or methoxy; and R_4 is hydrogen, methoxy or dimethylamino are antispasmodic agents abolishing spastic contractions and lowering hypertonicity of the ileum and colon.

3,700,674
4-ALKYLAMINO-3-NITROQUINOLINES

Robert Eugene Diehl, Trenton, and Richard Joseph Magee, Princeton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed April 30, 1969, Ser. No. 820,649
Int. Cl. C07d 33/52
U.S. Cl. 260—288 R 5 Claims

The herbicidal compounds have the formula:



wherein:

R_1 and R_2 are each hydrogen, lower alkyl, or (lower alkylthio)lower alkyl except that R_1 and R_2 may not both be hydrogen,

X is hydrogen, halo, or trifluoromethyl.

3,700,675
ESTER OF 2-HYDROXY-CYCLOHEXANE-2-SUBSTITUTED CARBOXYLIC ACIDS

Luigi Turbanti, Via Bonaccorso Da Padule, 10, Pisa, Italy

Division of Ser. No. 632,563, April 21, 1967, abandoned. This application Sept. 11, 1970, Ser. No. 71,360
Int. Cl. C07d 29/24
U.S. Cl. 260—293.82 7 Claims

The invention provides esters of 2-phenyl-2-hydroxy-cyclohexane-carboxylic acid and of 2-cyclohexyl-2 hydroxy-cyclohexane-carboxylic acid, as well as physiologically compatible salts thereof, which esters and salts have a substantial antispastic activity.

3,700,676
PROCESS FOR PREPARING SALTS OF PYRIDINETHIOL N-OXIDES AND 2,2'-DITHIOPYRIDINE N,N-DIOXIDES

Ralph A. Damico, Colerain Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 692,274, Dec. 21, 1967, Pat. No. 3,590,035. This application Aug. 10, 1970, Ser. No. 62,723
Int. Cl. C07d 31/50
U.S. Cl. 260—294.8 G 5 Claims

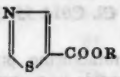
Process for preparing 2-pyridine N-oxide carbanion salts, 2-pyridinethiol N-oxides, salts thereof and 2,2'-dithiopyridine N,N-dioxides which comprises the steps of (1) reacting a pyridine N-oxide with a strong base at from −70° to 150° C. to form a novel pyridine N-oxide carbanion salt and (2) reacting the carbanion salt formed with a sulfur-containing reagent.

3,700,677
CERTAIN THIAZOLE-5-CARBOXYLATES

Francois Clemence, Rosny-sous-Bois, and Odile Le Martret, Paris, both of France, assignors to Roussel-UcLaf, Paris, France

Filed July 15, 1969, Ser. No. 842,016
Claims priority, application France, July 18, 1968, 68159716; Oct. 16, 1968, 68170114
Int. Cl. C07d 91/32
U.S. Cl. 260—294.8 D 8 Claims

5-thiazol carboxylates of the formula



I

wherein R is an alkali-metal atom, the residue of an organic base or the alkyl radical of an aliphatic, arylaliphatic or alkyl-heterocyclic alcohol having hypolipemiant activity and their preparation.

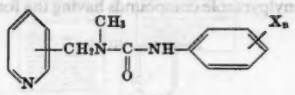
3,700,678

1-PICOLYL-3-PHENYL UREAS

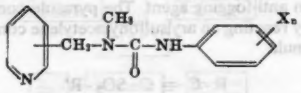
Alexander Mihallovski, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Filed April 30, 1971, Ser. No. 139,221
Int. Cl. C07d 31/40
U.S. Cl. 260—295 E 4 Claims

Compounds of the formula



in which X is nitro, methyl or trifluoromethyl, and *n* is an integer 1 or 2. The utility as post and pre-emergence herbicides of the compounds of the formula



in which X is hydrogen, halogen, nitro, methyl, and trifluoromethyl, and *n* is an integer 1 or 2.

3,700,679

NUCLEAR SUBSTITUTED DERIVATIVES OF 1-HYDROXY-6-METHOXYPHENAZINE 5,10-DIOXIDE

Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 8, 1970, Ser. No. 44,555
Int. Cl. C07d 51/8 0
U.S. Cl. 260—267 5 Claims

Nuclear substituted derivatives of 1-hydroxy-6-methoxyphenazine 5,10-dioxide which possess broad spectrum antimicrobial activity are disclosed.

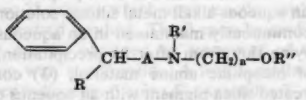
3,700,680

AMINOALKANOL ESTERS AND THEIR PHARMACEUTICALLY ACCEPTABLE ACID-ADDITION SALTS

Hidehiko Kaneko, Minoo-shi, Osaka-fu; Jiro Aritomi, Nara-shi, Nara-ken, and Keiji Nakamura, Neyagawa-shi, Osaka-fu, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd.

Filed Oct. 9, 1968, Ser. No. 766,297
Claims priority, application Japan, Oct. 13, 1967, 42/65896; Oct. 13, 1967, 42/65897
Int. Cl. C07d 31/34; C07c 69/78
U.S. Cl. 260—295.5 R 10 Claims

Aminoalkanol esters of the formula:



wherein R is hydrogen or phenyl, R' is hydrogen or alkyl having one to four carbon atoms, R'' is acyl, A is ethylene or methylmethylene and *n* is an integer of 2 or 3. The aminoalkanol esters and their pharmaceutically acceptable acid-addition salts are useful as medicaments for treatment of cardiovascular diseases.

3,700,681

2-HYDROXYMETHYL-3-HYDROXY-6-(1-HYDROXY-2-AMINOETHYL)PYRIDINES

Wayne E. Barth, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Feb. 16, 1971, Ser. No. 115,878
Int. Cl. C07d 31/42
U.S. Cl. 260—296 AE 9 Claims

2-Hydroxymethyl-3-hydroxy-6-(1-hydroxy-2-aminoethyl)-pyridines and salts thereof, a novel class of β-adrenergic agonist bronchodilators in mammals, and 2-hydroxymethyl-3-benzyloxy-6-pyridinecarboxaldehyde a valuable intermediate in the preparation of the subject compounds.

3,700,682

CERTAIN PYRIDINIUM DERIVATIVES OF CYCLOHEPTYL-IMIDAZOLES

Nobuo Soma; Mitsuo Watatani; Junichi Nakazawa; Yoshio Sato, all of c/o Central Research Laboratories Sankyo Co., Ltd. 2-58, 1-chome Hiromachi, Shinagawa-ku, Tokyo; Yoshimi Kuwabara, 18, 2-chome Naka-machi, Koganei-shi, Tokyo, and Hidehiko Ishikawa, 921, 4-chome Juji, Odawara-shi, all of Japan

Filed March 13, 1967, Ser. No. 622,475
Claims priority, application Japan, March 19, 1966, 41/17040
Int. Cl. C07d 31/44; G03c 5/32
U.S. Cl. 260—295.5 1 Claim

The present invention encompasses certain 2-aryl or 2-pyridinium cycloheptyl-imidazoles. These compounds may be prepared by reacting 2-halogeno-tropone or 2-methoxy-tropone with the appropriately substituted amidine. They are useful as desensitizers for light sensitive silver halide photographic materials.

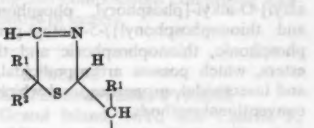
3,700,683

PROCESS OF MAKING THIAZOLINES-3

Friedrich Asinger, Aachen; Heribert Offermanns, Grossauheim, and Mikols Ghyczy, Laurensberg, all of Germany, assignors to Deutsche Gold- Und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, Germany

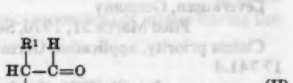
Filed Sept. 4, 1969, Ser. No. 855,417
Claims priority, application Germany, Sept. 6, 1968, P 17 95 299.7
Int. Cl. C07d 91/24
U.S. Cl. 260—306.7 11 Claims

2,5,5-substituted thiazolines-Δ^3 of the formula



(I)

in which R^1 and R^2 are alkyl and may be the same or different, alkyl having one to four carbon atoms are made by reacting an aldehyde of the formula



(II)

wherein X has the same meaning as above, with sulfur and ammonia or an ammonium or sulfur compound in the presence of a secondary or tertiary amine while azeotropically removing the reaction water.

The process results in very high yields.

3,700,684

CERTAIN 2-AMINO-1,3,4-THIADIAZOLES

William Alan Remers, Lafayette, Ind.; Gabriel Joseph Gibs, Pearl River, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 766,986, Oct. 11, 1968, Pat. No. 3,564,002. This application Oct. 30, 1970, Ser. No. 85,736

Int. Cl. C07d *91/62*

U.S. Cl. 260—306.8 D 3 Claims

The preparation of 2-amino or substituted amino-5-substituted thiadiazoles are described. They are useful in the treatment of ascariasis and as intermediates for the preparation of, for example, 2-(2-amino-5-1,3,4-thiadiazolyl)-1-methyl-5-nitroimidazole which has anti-protozoal and antibacterial properties.

3,700,685

NITROIMIDAZOLE DERIVATIVES

Dale R. Hoff, Basking Ridge, N.J., and Clarence S. Rooney, Beaconsfield, Quebec, Canada, assignors to Merck & Co. Inc., Rahway, N.J.

Filed May 15, 1970, Ser. No. 37,894

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 4 Claims

5-Nitroimidazoles substituted with 2-lower-alkylene sulfides and the corresponding sulfoxides and sulfones are disclosed, as well as their preparation from the 2-(haloloweralkyl)-5-nitroimidazoles and a salt of a mercaptan. Compositions containing these compounds as the active ingredient for treatment of bacterial and prolozaal infections are also disclosed.

3,700,686

O-ALKYL-O-PYRAZOLYL-PHOSPHORIC, PHOSPHONIC, THIONOPHOSPHORIC AND THIONOPHOSPHONIC ACID ESTERS

Christa Fest, Wuppertal-Elberfeld; Ingeborg Hammann, and Wolfgang Behrenz, both of Cologne, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed March 5, 1970, Ser. No. 16,934

Claims priority, application Germany, March 14, 1969, P 19 12 972.7

Int. Cl. C07d *49/18* ; C07f *9/40*

U.S. Cl. 260—310 R 10 Claims

O-alkyl-O-pyrazolyl-phosphoric, phosphonic, thionophosphoric and thionophosphonic acid esters, i.e., (alkyl, phenyl and O-alkyl)-O-alkyl-O-[1-([alkyl, phenyl and O-alkyl]-O-alkyl-[phosphoryl, phosphonyl, thionophosphoryl and thionophosphonyl])-5-methyl-pyrazol-3-yl]-phosphoric, phosphonic, thionophosphoric and thionophosphonic acid esters, which possess arthropodicidal, especially acaricidal and insecticidal, properties, and which may be produced by conventional methods.

3,700,687

(THIONO) PHOSPHORIC (PHOSPHONIC)-ACID ESTERS

Hellmut Hoffmann, Wuppertal-Elberfeld; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed March 31, 1970, Ser. No. 24,397

Claims priority, application Germany, April 15, 1969, P 19 17 741.4

Int. Cl. C07d *49/18* ; C07f *9/40*

U.S. Cl. 260—310 R 12 Claims

Esters of (thiono) phosphoric or phosphonic acid esters and ester amides as the acid moiety and [3-methyl-5-hydroxy-pyrazolyl-1]-(thiono) phosphoric or phosphonic acid esters as the alcohol moiety, which possess arthropodicidal, especially acaricidal and insecticidal, properties, and which may be produced by conventional methods.

3,700,688

ARYLSULFONYLPYRAZOLE COMPOUNDS

Issei Iwai; Yukichi Kishida, and Tadahiro Iwashige, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

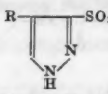
Filed Oct. 1, 1970, Ser. No. 77,347

Claims priority, application Japan, Oct. 3, 1969, 44/79073

Int. Cl. C07d *49/18*

U.S. Cl. 260—310 R 5 Claims

Arylsulfonylpyrazole compounds having the formula



wherein R and R′ are the same or different and each represents an aryl group which may be substituted with a straight or branched lower alkyl, lower alkoxy or halogen, are useful as an anti-fogging agent. The pyrazole compounds are prepared by reacting an arylsulfonylacetylene compound having the formula

$$R\text{-}C \equiv C\text{-}SO_2\text{-}R'$$

wherein R and R′ are the same as above with diazomethane in the presence of an inert organic solvent such as ether.

3,700,689

2(SUBSTITUTED PHENYL)-8H-PYRAZOLO-(5,1A)ISOINDOL-8-ONE

Blaine Chase McKusick, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 10, 1970, Ser. No. 97,030

Int. Cl. C07d *57/24*

U.S. Cl. 260—310 R 5 Claims

Certain 8H-pyrazolo[5,1-a]isoindol-8-ones are effective plant growth modifiers.

3,700,690

SILICA PIGMENTS AND ELASTOMER-SILICA PIGMENT MASTERBATCHES AND PRODUCTION PROCESSES RELATING THERETO

Oliver W. Burke, Jr., 1510 S.W. 13th Court, P.O. Box 2266, Fort Lauderdale, Fla.

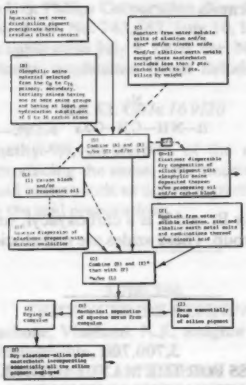
Continuation-in-part of Ser. No. 55,384, July 16, 1970, and a continuation-in-part of Ser. No. 55,476, July 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 798,215, Sept. 16, 1968, abandoned, which is a division of Ser. No. 611,250, Jan. 24, 1967, Pat. No. 3,523,096, which is a continuation-in-part of Ser. No. 458,420, May 24, 1965, abandoned, and a continuation-in-part of Ser. No. 458,379, May 24, 1965, abandoned, and a continuation-in-part of Ser. No. 479,806, Aug. 16, 1965, Pat. No. 3,401,017. This application Jan. 11, 1972, Ser. No. 216,948

Int. Cl. C08c *11/10*; C08k *1/08*

U.S. Cl. 260—33.6 AO 12 Claims

Curbing of silica pigment losses and the promotion of uniformity of product in the preparation of an elastomer-silica pigment masterbatch are effected (a) by combining (1) an aqueously wet hydrated silica pigment precipitate which has a bound alkali content, which has been prepared by precipitation from an aqueous alkali metal silicate solution, and which has been continuously maintained in an aqueously wet state without drying therefrom after its precipitation, with (2) a quantity of oleophilic amine material, (3) combining the resulting treated silica pigment with an aqueous dispersion of the elastomer containing an anionic dispersing agent, with or without (4) carbon black and/or processing oil, and (5) with selected reactant-coagulant, and (b) recovering the resulting coagulum as a masterbatch, the steps prior to (b) having rendered the serum of the aqueous mixture essentially free of silica pigment. Prior to combination with the elastomer dispersion the amine treated alkaline silica pigment may be

recovered as a useful dispersible alkaline silica pigment product, or the wet pigment may be treated with water soluble salt of aluminum, or zinc or the alkali earth metals and/or with water soluble mineral acid or organic acids, as well as with the



said amine, and after such treatment the resulting pigment composition may be recovered as a useful dispersible silica pigment product, or the so treated wet silica pigment may be combined as in (3), (4) and (5) above, and be recovered as in (b) above in the form of a masterbatch.

3,700,691
3,3-DISUBSTITUTED-3,4-DIHYDROBENZODIOXEPINS

Burton K. Wasson, 103 Broadview, Valois, Quebec, and Haydn W. R. Williams, 348 Barberry Place, Dollard des Ormeaux, Quebec, both of Canada, assignors to Charles E. Frosst & Co., Montreal, Quebec, Canada

Continuation-in-part of Ser. No. 755,442, Aug. 26, 1968, abandoned. This application June 9, 1969, Ser. No. 832,879
Int. Cl. C07d *13/00*
U.S. Cl. 260—340.3 **23 Claims**

3-Hydroxy-3-(substituted-aminoalkyl)-3,4-dihydro-2H-1,5-benzodioxepin products are described that exhibit β-adrenergic stimulating properties and are therefore suitable for use as broncho-dilating agents. The products are prepared essentially by four principal routes from 3-oxo-3,4-dihydro-2H-1,5-benzodioxepins. By one route the 3-oxobenzodioxepin is treated with a nitroalkane to give a 3-hydroxy-3-nitroalkyl-benzodioxepin the nitro group of which is reduced to an amine and the resulting compound reacted with an aldehyde or ketone under hydrogenating conditions to introduce the desired substituent into the amino function. By a second route the 3-oxobenzodioxepin is reacted with an alkali metal nitrile to form the cyanhydrin which upon reduction forms the 3-hydroxy-3-aminoalkyl-benzodioxepin that can be treated with a ketone or aldehyde to give the desired products or can be reacted with sodium nitrite or other agent to form a 3-spiro-benzodioxepin-2′-oxirane which upon reaction with an amine provides the desired product. The 3-spiro-benzodioxepin-2′-oxirane also can be obtained by treatment of the 3-oxo-benzodioxepin with a sulfurylide. A fourth method involves forming a benzodioxepin-3-spiro-5′-oxazolidin-2′-one which upon treatment with dilute alkali gives the desired 3-hydroxy-3-(substituted aminoalkyl)-3,4-dihydro-2H-1,5-benzodioxepin. The intermediate oxazolidinone compounds can be treated if desired with various agents to attach substituents on the benzenoid moiety of the starting substance. These oxazolidinones exhibit β-stimulating and skeletal muscle relaxant properties.

3,700,692
1-(4′-HYDROXY-3′-(HYDROXY METHYL)-PHENYL)-1-HYDROXY-2-ARALKYLAMINOETHANES

John T. Suh, Mequon, and Thomas M. Bare, Milwaukee, both of Wis., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed June 4, 1971, Ser. No. 150,220
Int. Cl. C07d *13/10*
U.S. Cl. 260—340.5 **6 Claims**

The 1-[4′-hydroxy-3′-(hydroxymethyl)-phenyl]-1-hydroxy-2-aralkylaminoethanes are useful as bronchodilating agents. The compound α^1-[[(α-methyl-3,4-methylene-dioxyphenethyl)amino]-methyl]-4-hydroxy-m-xylene-α^1,α^3-diol is especially useful since it is an excellent bronchodilator and yet exerts only a minimal effect on cardiac muscle.

3,700,693
FLUOROORGANOCOPPER COMPOUNDS, COMPLEXES AND SOLUTIONS THEREOF FOR COPPER-COATING SUBSTRATES

Allan Cairncross, and William Arthur Sheppart, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 725,541, May 30, 1968, abandoned, which is a continuation-in-part of Ser. No. 557,605, June 15, 1966, abandoned. This application Dec. 2, 1970, Ser. No. 102,569
Int. Cl. C07d *15/00*; C07f *1/08*
U.S. Cl. 260—340.6 **8 Claims**

Described and claimed are fluoroorganocopper compounds prepared preferably by the metathetical reaction of a fluoroorganometallic compound with a copper-containing compound. These are highly soluble in inert organic solvents and have a greater thermal stability compared to non-fluorinated organocopper compounds. Complexes are formed by interaction of fluororganocopper compounds with dioxane. Fluoroorganocopper compounds are useful for the preparation of finely divided copper metal and for copper-coating various substrates.

3,700,694
INSECT CONTROL

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 860,086, Sept. 22, 1969, abandoned. This application June 14, 1971, Ser. No. 153,073
Int. Cl. C07d *5/06*
U.S. Cl. 260—343.6 **15 Claims**

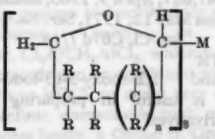
Methods of employing and compositions comprising alkylated lactones for the control of insects.

3,700,695
FLUORINATED TETRAHYDRO-PYRANS

Russell L. K. Carr, Grand Island, N.Y., and Charles F. Baranauckas, Edina, Minn., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. Nos. 178,227, March 8, 1962, abandoned, and Ser. No. 716,273, March 14, 1968, abandoned. This application Oct. 16, 1969, Ser. No. 868,288
Int. Cl. C07d *7/04*
U.S. Cl. 260—345.8 **1 Claim**

There are described new compositions of matter having the following general formula



wherein *n* is from 0 to 1, wherein one of the R's is selected from the group consisting of fluorine, alkyl, cycloalkyl, aryl, perfluoroalkyl, perfluorocycloalkyl and perfluoroaryl, wherein another one of the R's may be selected from the group consisting of alkyl and perfluoroalkyl, wherein the remaining R's are selected from the group consisting of hydrogen and fluorine, provided that at least one of the R's contains fluorine or is fluorine, *s* is a number from 1 to 3 inclusive, and M is a substance selected from the group consisting of fluorine, chlorine, bromine, iodine, cyano, alkylcarbonyloxy, arylcarbonyloxy, cycloalkylcarbonyloxy, alkylsulfonyloxy, cycloalkylsulfonyloxy, arylsulfonyloxy, phosphinylidynetrioxy, phosphinidynetrioxy, alkoxyphosphinidenedioxy, dialkoxyphosphinoxy, aryloxyphosphinidenedioxy, diaryloxyphosphinoxy, alkylphosphinylidenedioxy, arylphosphinylidenedioxy, sulfonyl and sulfinyl. The preparation of these compounds and their uses in improving the clarity of plastic films and as herbicides are also described.

3,700,696

BOLL WEEVIL SEX ATTRACTANT

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Filed Jan. 7, 1970, Ser. No. 1,305
Int. Cl. C07d 7/06
U.S. Cl. 260—343.5 **10 Claims**

Synthesis of cis 2-(1'-methyl-2'-iso-propenylcyclobutyl)ethanol, a component of the boll weevil sex attractant, and 3-methyl-pent-2-eno-5-lactone and 2,3-cycloethylene-3-methylpentano-5-lactone which are intermediates therefor.

3,700,697

(2,3-DIHYDRO-2-BENZOFURANYLMETHYL) GUANIDINES AND THEIR PREPARATION

Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed April 22, 1968, Ser. No. 723,234
Int. Cl. C07d 5/42
U.S. Cl. 260—346.2 R **7 Claims**

(2,3-Dihydro-2-benzo-furanylmethyl)guanidines and (2,3-dihydro-2-benzofuranylmethyl)-aminoguanidines, having anti-hypertensive activity, are prepared by reacting the corresponding respective 2,3-dihydro-2-benzo-furanylmethylamine or (2,3-dihydro-2-benzofuranylmethyl)hydrazine with a guanylating agent, e.g., 2-(lower-alkyl)-2-thiopseudourea or cyanamide. Preparation of various intermediates are given, e.g., 2,3-dihydro-2-benzofuranylmethyl halides, N-(2,3-dihydro-2-benzofuranylmethyl)phthalimides, 2,3-dihydro-2-benzofuranylmethylamines and (2,3-dihydro-2-benzofuranylmethyl)hydrazines.

3,700,698

1,2-EPOXY-3-(3-IODO-2-PROPYNYLOXY)-PROPANE

Alden Gamaliel Beaman, North Caldwell, N.J.; Robert Duschinsky, Pully-Lausanne, Switzerland, and William Paul Tautz, New York, N.Y., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 61,516, Aug. 5, 1970, Pat. No. 3,641,047, which is a division of Ser. No. 840,077, April 23, 1969, Pat. No. 3,549,653, which is a division of Ser. No. 556,585, June 10, 1966, Pat. No. 3,468,902, which is a continuation-in-part of Ser. No. 447,087, April 9, 1965, abandoned. This application May 12, 1971, Ser. No. 142,777
Int. Cl. C07d 1/18
U.S. Cl. 260—348 R **1 Claim**

The compound 1,2-epoxy-3-(3-iodo-2-propynyloxy)-propane, which is useful in preparing antimicrobial-2-nitroimidazole derivatives.

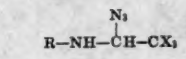
3,700,699

N-(1-AZIDO-(2,2,2-TRIHALOETHYL) SULFONAMIDES

Malcolm S. Singer, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 789,595, Jan. 7, 1969, Pat. No. 3,636,062. This application June 28, 1971, Ser. No. 163,521
Int. Cl. C07c 117/00; C07d 109/00
U.S. Cl. 260—349 **4 Claims**

Azides of the formula



in which X is Cl or Br and R is a carboxyacyl, sulfonylacyl or alkoxycarbonyl group. These azides are nematocidal.

3,700,700

PROCESS FOR THE MANUFACTURE OF AMINOANTHRAQUINONES

Hans Altermatt, Reinach, Basel-Land, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 631,879, April 19, 1967, abandoned. This application Dec. 8, 1969, Ser. No. 883,343
Claims priority, application Switzerland, May 11, 1966, 6880/66
Int. Cl. C09b 1/22
U.S. Cl. 260—371 **15 Claims**

Process for the preparation of anthraquinones containing a primary amino group by heating the corresponding aminoanthraquinones containing a secondary or tertiary amino group in an organic solvent.

3,700,701

PREPARATION OF BENZOQUINONES BY OXIDATION OF PARA-SUBSTITUTED PHENOLS

Hans K. Dietl, and Howard S. Young, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 10, 1971, Ser. No. 151,904
Int. Cl. C07c 49/64
U.S. Cl. 260—396 R **5 Claims**

Process for producing substituted benzoquinones through oxidation of para-substituted phenols by manganese dioxide in a mixture of aqueous sulfuric acid and a cosolvent. A typical para-substituted phenol reactant is 2,6-di-tert-butyl-p-cresol, and its oxidation product is 2,6-di-tert-butyl-p-benzoquinone.

3,700,702

NEW 15β,16β-METHYLENE STEROIDS

Andor Furst, Basel; Marcel Muller, Frenkendorf; Peter Muller, Arlesheim; Arno Johannes Schocher, Benken, and Elisabeth Becher, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 2, 1970, Ser. No. 94,585
Int. Cl. C07c 169/32
U.S. Cl. 260—397.45 **12 Claims**

A new series of 15β,16β-methylene pregnanes is disclosed and methods for their preparation are described. The compounds are particularly useful as antiinflammatory agents.

3,700,703

STEROIDS OF THE ANDROSTANE SERIES, METHODS OF PRODUCING THE SAME, PHARMACEUTICAL PREPARATIONS CONTAINING SAID COMPOUNDS AS ACTIVE INGREDIENTS AND METHODS OF PRODUCING THE SAID PREPARATIONS

Rudolf Van Moorselaar, Van Houtenlaan, Weesp, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 743,647, July 10, 1968, abandoned. This application July 2, 1970, Ser. No. 56,122

Claims priority, application Great Britain, July 11, 1967, 31,786/67

Int. Cl. C07c *169/20*

U.S. Cl. 260—397.4 11 Claims

New 18-methyl-9β,10α-steroids of the androstane series, methods of producing the same, pharmaceutical preparations containing said compounds as active ingredients and methods of producing the said preparations.

3,700,704

TRIGLYCERIDE REFINING

Albert S. Zambone, Vineland, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 27, 1970, Ser. No. 15,238

Int. Cl. C11b *3/06, 3/16*

U.S. Cl. 260—425 10 Claims

A new use for a centrifuge having an axial screw conveyor, heretofore used only for liquid-solids separation, is proposed for liquid-liquid separation in the refining of triglycerides.

3,700,705

METHOD OF REFINING TRIGLYCERIDES

Albert S. Zambone, Vineland, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed April 16, 1970, Ser. No. 29,275

Int. Cl. C08h *17/36*

U.S. Cl. 260—425 16 Claims

In triglyceride refining, with soapstock produced as a by-product, the mixture resulting from the introduction of an alkaline reagent is separated by introducing it to a zone of centrifugation formed about an axis and in which the soapstock occupies an outer portion of the zone and the refined triglyceride occupies an inner portion of said zone, and the refined triglyceride is withdrawn from the zone, the separated soapstock is uniquely withdrawn from the zone by advancing it axially and inwardly toward the axis away from the refined triglyceride, and then discharging the separated soapstock from said zone.

3,700,706

SELECTIVE CARBONYLATION OF OLEFINICALLY UNSATURATED HYDROCARBONS USING PALLADIUM-PHOSPHINE CATALYSTS PROMOTED WITH TIN SALTS

Stephen A. Butter, Boundbrook, N.J., assignor to Mobil Oil Corporation

Continuation-in-part of Ser. No. 13,170, Feb. 20, 1970, abandoned. This application Aug. 17, 1970, Ser. No. 64,631

Int. Cl. C07c *51/14*

U.S. Cl. 260—410.9 R 13 Claims

A carbonylation process is provided for conversion of olefinically unsaturated hydrocarbons to a mixture of esters or acids with an increased ratio of normal:iso (i.e., straight:branched) ester or acid by reaction with carbon monoxide and a hydroxylic compound, said process being carried out in the presence of a palladium salt complexed with a phosphine ligand as a catalyst and tin cocatalysts or promoters. For example, the catalyst may be palladium dichloride bis(triphenylphosphine) and the tin cocatalyst or promoter present may be stannous chloride dihydrate.

3,700,707

TITANIUM TRIHALIDE-AMINE HYDROHALIDE COMPLEXES

Richard R. Durst, Stow, and Heinz Uelzmann, Cuyahoga Falls, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 824,670, May 14, 1969, Pat. No. 3,627,797, which is a division of Ser. No. 493,868, Oct. 7, 1965, abandoned. This application Aug. 13, 1971, Ser. No. 171,740

Int. Cl. C07f *7/28*

U.S. Cl. 260—429.5 9 Claims

Compositions of aluminum trihydrocarbyls (triisobutyl aluminum) and titanium (III) halide-amine hydrohalide complexes are useful in the polymerization of cyclic oxides such as ethylene oxide, allyl glycidyl ether, propylene oxide, oxetane and the like. The complex has the formula $YH^+(TiX_4)^-$ where Y is an amine having up to 20 carbon atoms and a pK value of not greater than 12, X is halogen and Ti has a valence of three and is prepared by reacting a mercaptan and an amine with a titanium tetrahalide. The resulting complex and disulfide can be separated from each other by virtue of their different solubilities.

3,700,708

BIS(DIFLUOROAMINO) ALKYL SUBSTITUTED COMPOUNDS AND METHOD OF PREPARATION

Robert C. Petry, Huntsville, Ala., assignor to Rohm & Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 790,023, Jan. 29, 1959, abandoned. This application Sept. 4, 1959, Ser. No. 838,354

Int. Cl. C07c *8 7/20, 119/04, 127/16*

U.S. Cl. 260—453 AL 19 Claims

2. Bis(difluoroamino) alkane and alkene compounds containing bis(difluoroamino) substituents in which the difluoroamino groups are attached to carbon atoms, said carbon atoms containing at least one hydrogen substituent, and said carbon atoms being adjacent to one another or in a 1,4 position to one another.

3,700,709

AZOMETHINE PIGMENTS

Eric Richard Inman, Bridge of Weir, Renfrewshire; Ian Alexander MacPherson, Paisley, and John Andrew Stirling, Glasgow, all of Scotland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed May 20, 1970, Ser. No. 39,163

Int. Cl. C07f *11/00*

U.S. Cl. 260—438.1 17 Claims

Copper complexes of substituted 2,2'-dihydroxyphenylnapthyl-azomethines are prepared by reacting the products of o-hydroxy-naphthaldehydes and o-aminophenols with a coppering agent. Said compounds are pigments for organic materials.

3,700,710

METHYLENE BIS(ALUMINUM DIHALIDES) USEFUL AS POLYMERIZATION CATALYST COMPONENTS

Edward H. Mottus, Ballwin, and Morris R. Ort, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 621,036, March 2, 1967, abandoned, which is a continuation-in-part of Ser. No. 539,662, April 4, 1966, abandoned. This application March 10, 1970, Ser. No. 23,109

Int. Cl. C07f *5/06*

U.S. Cl. 260—448 A 2 Claims

An electrolytic process is described for making certain bis-(halometal)methanes such as bis(dichloroaluminum)methane, $Cl_2AlCH_2AlCl_2$, which is a new compound, and these compounds can be combined with transition metal compounds such as $VOCl_3$ to make very active catalysts for polymerizing olefinic compounds such as ethylene. In the electrolytic process boron, a Group II, Group III A or Group

IV A metal, e.g., aluminum, is used as an anode with an electrolyte such as $HOAlCl_2$ in the presence of a methylene dihalide such as CH_2Cl_2 or a gem dihalide which does not readily dehydrohalogenate or alkylate. It is preferred to carry out the electrolysis in the presence of ethylene or another olefinic compound to promote conductivity. Also, it is preferred that all reactants be substantially free of water, except for small known amounts of water which may be added to promote electrolysis. Also, it is preferred to blanket the electrolysis with ethylene which also serves to promote conductivity, or an inert gas to exclude moisture, oxygen and other undesirable materials. The catalysts polymerize olefinic compounds to liquid or solid polymers depending on the particular catalyst used and the olefin being polymerized. The catalysts are promoted or modified by small amounts of water or other electron donor compounds.

3,700,711

SILICONE COMPOUNDS CONTAINING HYDRAZONE FUNCTIONAL GROUPS THEREON

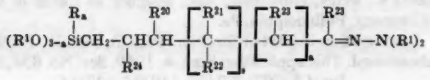
Abe Berger, and Terry G. Selin, both of Schenectady, N.Y., assignors to General Electric Company

Filed Aug. 16, 1971, Ser. No. 172,293

Int. Cl. C07f 7/10, 7/18

U.S. Cl. 260—448.8 R **7 Claims**

A new class of silicone compounds of the formula,



where R, R^1, R^{20}, R^{21}, R^{22}, R^{23} and R^{24} are independently selected from hydrogen and hydrocarbon radicals, s varies from 0 to 1 and u varies from 0 to 20, and a is a whole number that varies from 0 to 2. These class of compounds are particularly useful for flocculating colloidal organic matter.

3,700,712

PROCESS FOR PREPARING SILICON PEROXIDE COMPOUNDS

Robert Leopold Ostrozynski, Mahopac, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 7, 1971, Ser. No. 178,453

Int. Cl. C07f 7/08

U.S. Cl. 260—448.2 E **17 Claims**

A process for preparing a silicon peroxide compound comprising reacting a dimethylamino silicon compound with a hydroperoxide compound.

3,700,713

NITROGEN-CONTAINING COMPOUNDS

John Heathcote Atherton, Stevenston, and John Beckett Plumb, West Kilbride, both of Scotland, assignors to Imperial Chemical Industries Limited, Millbank, England

Filed July 10, 1969, Ser. No. 840,853

Claims priority, application Great Britain, July 26, 1968, 35,859/68

Int. Cl. C07f 7/10, 7/18

U.S. Cl. 260—448.2 N **11 Claims**

Nitrogen-containing compounds comprising organo-silicon compounds containing at least one unit of the average general formula

$$B_s(DO)_tA_rSiO_{\frac{4-r-s-t}{2}}$$

where A is a group of the general formula

$$-R[OR'\overset{O}{\overset{\|}{C}}N(R^3)R^3NR^4R^5]_a$$

in which R is an organic group free from olefinic unsaturation and having a valency of $c+1$ and is selected from the group consisting of hydrocarbon groups having from three to 11 carbon atoms and groups consisting of carbon, hydrogen and oxygen, the latter in the form of ethereal linkages, having from six to 17 carbon atoms, R^1 is selected from the group consisting of lower alkylene groups, R^2 is selected from the group consisting of hydrogen, hydrocarbyl groups having not more than 12 carbon atoms and groups of the general formula $[R^3NRR^4R^5]$, R^3 is a divalent radical attached at its extremities to two nitrogen atoms and is selected from the group consisting of hydrocarbon groups having not more than 12 carbon atoms, polyimino groups of the general formula $[(R^7NH)_qR^8]$ where R^7 and R^8 are alkylene groups having not more than four carbon atoms and q is a positive integer not greater than 100, and groups forming a heterocyclic structure with the amino nitrogen and R^4 or with R^2, R^4 and the two nitrogen atoms attached to the extremities of R^3, R^4, when not a member of a heterocyclic structure, is selected from the group consisting of hydrogen, hydrocarbyl and hydroxy substituted hydrocarbyl groups and amino-alkyl and N-substituted amino-alkyl groups, R^5 is selected from the group consisting of hydrogen, hydrocarbyl groups, hydroxy substituted hydrocarbyl groups, amino-alkyl and N-substituted amino-alkyl groups, c is 1, 2 or 3, B is a hydrocarbyl group free from aliphatic unsaturation, D is selected from the group consisting of hydrocarbyl groups and groups of the general formula $B(OC_nH_{2n})_x$, r is 1 or 2, s is 0, 1, 2, or 3, t is 0, 1, 2, or 3 and $r+s+t$ is not greater than 4.

3,700,714

CURABLE COMPOSITIONS

Stephen B. Hamilton, 931 Vrooman Avenue, Schenectady; Melvin D. Beers, 14 Cornelia Avenue, Ballston Lake; Abe Berger, 1504 Barclay Place, and Terry G. Selin, 2279 Dean Street, both of Schenectady, all of N.Y.

Division of Ser. No. 34,576, May 4, 1970. This application June 24, 1971, Ser. No. 156,464

Int. Cl. C07f 7/18

U.S. Cl. 260—448.2 B **13 Claims**

Room temperature vulcanizing silicone elastomers are prepared by the addition of a novel cross-linking agent such as acetoxypropenylenyltriacetoxysilane to a silanol chain-stopped polydiorganosiloxane fluid. These compositions are stable, free flowing fluids in the absence of moisture but cure to a rubbery, solid elastic state upon exposure to moisture. These compositions are particularly useful as adhesives in difficult bonding situations such as attaching glass window panes to aluminum window frames.

3,700,715

POLYAMINOALKYLTHIOALKYL SILANES

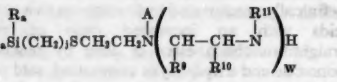
Abe Berger, Schenectady, N.Y., assignor to General Electric Company

Filed Aug. 23, 1971, Ser. No. 174,164

Int. Cl. C07f 7/10, 7/18

U.S. Cl. 260—448.8 R **8 Claims**

A novel class of silicone compounds of the formula,



where R and R^1 are independently selected from monovalent hydrocarbon radicals, R^9, R^{10} and R^{11} are selected from the

class consisting of hydrogen, alkyl radicals and aryl radicals, A is selected from hydrogen, alkyl radicals, aryl radicals and amino alkyl radicals, *j* varies from 2 to 20, *w* varies from 1 to 500 and varies from 0 to 2. The novel compounds are useful as flocculants for colloidal organic matter.

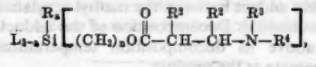
3,700,716

AMINO-FUNCTIONAL SILANE COMPOUNDS

Abe Berger, and Terry G. Selin, both of Schenectady, N.Y., assignors to General Electric Company

Filed Aug. 12, 1971, Ser. No. 171,337
Int. Cl. C07f 7/10, 7/18
U.S. Cl. 260—448.2 N 7 Claims

A silicone compound of the formula,



where L is selected from secondary amine groups and R^{10} groups, R^1 and R^2 are selected from hydrocarbon groups and R^3 and R^4 are selected from hydrogen, hydrocarbon groups and other amine groups. Further, *n* is a whole number that varies from 1 to 20 and *a* is a whole number that varies from 0 to 2. These amino-functional silane compounds may be used as sewage flocculents.

3,700,717

PROCESS FOR THE MANUFACTURE OF LAVANDULIC ACID AND DERIVATIVES

Heinrich Kappeler, Wurenlos, and Jost Wild, Zurich, both of Switzerland, assignors to Gevaudan Corporation, Clifton, N.J.

Filed Dec. 23, 1968, Ser. No. 786,413
Claims priority, application Switzerland, Jan. 10, 1968, 536/68
Int. Cl. C07c 57/02, 121/30
U.S. Cl. 260—465.2 8 Claims

A synthetic process for producing lavandulol (III) and lavandulyl acetate (V) economically and in pure form is disclosed. This is accomplished by a novel process involving making lavandulic acid (II) by the rearrangement of a novel compound, 2-methyl-buten-2-yl-β, β-dimethyl acrylate (I). The lavandulic acid so formed may be reduced to lavandulol (III) or lavandulal (IV), converted into a lower alkyl ester (V) or into the novel lavandulic acid nitrile (VI). Lavandulol (III) may be transformed into the novel lavandulyl $\beta\beta$-dimethyl a acrylate (VII).

3,700,718

METHOD FOR CONTINUOUS PRODUCTION OF PURE ACETONE CYANOHYDRIN

Akio Yamagishi; Hisashi Kondo; Genya Matsumoto, and Shigekatsu Kondo, all of Niihama-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 854,461, Sept. 2, 1969, abandoned. This application Nov. 24, 1969, Ser. No. 879,366
Int. Cl. C07c 121/34
U.S. Cl. 260—465.6 6 Claims

Pure acetone cyanohydrin is produced continuously and economically by reacting acetone with hydrogen cyanide in the presence of an alkaline substance to produce an acetone cyanohydrin synthesis reaction mixture, acidifying the resultant reaction mixture with an acidic substance, filtering off the resultant salt from the mixture to obtain crude acetone cyanohydrin, stripping unreacted acetone and hydrogen cyanide from the crude acetone cyanohydrin with an inert gas, recovering pure acetone cyanohydrin, on the other hand, contacting the resultant inert gas containing the unreacted materials with the above-mentioned acetone cyanohydrin synthesis reaction mixture to absorb the unreacted materials into the reaction mixture, and then recycling the inert gas for next stripping.

3,700,719

PROCESSES FOR THE PREPARATION OF N-(DIETHYLAMINOETHYL)-4-AMINO-5-CHLORO-2-METHOXYBENZAMIDE

Masuo Murakami; Noriyoshi Inukai; Akio Koda, all of Tokyo, and Koji Nakano, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1969, Ser. No. 877,500
Claims priority, application Japan, Dec. 2, 1968, 43/87574; Dec. 9, 1968, 43/89521; April 4, 1969, 44/26274
Int. Cl. C07c 103/28
U.S. Cl. 260—471 R 10 Claims

Improved processes for obtaining N-(diethylaminoethyl)-4-amino-5-chloro-2-methoxybenzamide from p-aminosalycylic acid as starting material, each of which comprises only three or four steps.

3,700,720

PROCESS FOR THE PRODUCTION OF HALOGENATED BENZILIC ACID ALKYL ESTERS

Yair Sprinzak, Rehovoth, Israel, assignor to Yeda Research and Development Co., Ltd., Rehovoth, Israel

Filed Oct. 20, 1969, Ser. No. 867,890
Claims priority, application Israel, Oct. 21, 1968, 30 923
Int. Cl. C07c 69/76
U.S. Cl. 260—473 A 13 Claims

Halogenated benzilic acid alkyl esters are prepared by oxidizing the corresponding halogenated diphenylacetic acid alkyl ester in a polar-aprotic solvent in the presence of a quaternary ammonium hydroxide.

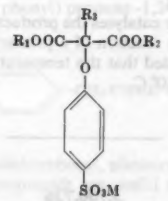
3,700,721

SULFOPHENOXY MALONATE COMPOUNDS

John A. Price, 225 North Princeton Avenue, Swarthmore, Pa., and Mary J. Stewart, 2 War-Trophy Lane, Riddlewood, Pa.

Division of Ser. No. 37,838, May 15, 1970, Pat. No. 3,624,034, which is a continuation-in-part of Ser. No. 867,375, Oct. 17, 1969, abandoned. This application Feb. 25, 1971, Ser. No. 119,013
Int. Cl. C07c 143/52
U.S. Cl. 260—470 4 Claims

Sulfophenoxy malonate compounds and copolyester resins utilizing said malonate compounds comprising the condensation product of (a) an aromatic dicarboxylic acid or its lower alkyl diester, (b) an aliphatic glycol, and (c) a minor amount of a substituted acid or ester thereof represented by the formula:



wherein R_1 and R_2 are both hydrogen or lower alkyl radicals, R_3 is hydrogen or a lower alkyl radical, and M is a metal.

3,700,722

DI(1-ACYLOXY-ALIPHATIC) ETHERS AND DERIVATIVES THEREOF

Lucian W. McTeer, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 569,017, Aug. 1, 1966, Pat. No. 3,499,028, which is a division of Ser. No. 458,757, May 25, 1965, Pat. No. 3,326,969, which is a continuation-in-part of Ser. No. 65,943, Oct. 31, 1960, abandoned, which is a continuation-in-part of Ser. No. 839,057, Sept. 10, 1959, abandoned. This application Dec. 27, 1968, Ser. No. 787,543
Int. Cl. C07c 69/52, 69/54, 69/56
U.S. Cl. 260—486 R 5 Claims

Asymmetrical di(1-acyloxyaliphatic) ethers produced by reacting a symmetrical di(1-acyloxyaliphatic) ether or a 1,2-

ethylenically unsaturated aliphatic 1-acyloxyaliphatic ether with a monocarboxylic acid.

3,700,723

2,2-BIS (DIFLUORAMINO)-5-FLUORO-5,5 DINITRO-1-PENTYL ACRYLATE

Clifford L. Coon, Fremont; Marion E. Hill, Palo Alto, and Donald L. Ross, Menlo Park, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 10, 1969, Ser. No. 866,436
Int. Cl. C07c *69/52*
U.S. Cl. 260—486 H 3 Claims

The propellant additive 2,2-bis (difluoramino)-5-fluoro-5,5 dinitro-1-pentyl acrylate is synthesized by reacting acryloyl chloride with 2,2-bis (difluoramino)-5-fluoro-5,5-dinitro-1-pentanol.

3,700,724

PREPARATION OF ALLYLIC ESTERS WITH PALLADATE AND PLATINATE CATALYSTS

Donnie G. Brady, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Jan. 21, 1971, Ser. No. 108,617
Int. Cl. C07c *67/00*
U.S. Cl. 260—491 9 Claims

Tetrahalopalladate and tetrahaloplatinate catalysts effectively catalyze the preparation of allyl esters of carboxylic acids in the reaction between allyl halides and salts of carboxylic acids.

3,700,725

DIALKYL PHTHALATE PROCESS

Louis R. Kray, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 29, 1971, Ser. No. 111,144
Int. Cl. C07c *69/8 0*
U.S. Cl. 260—475 R 3 Claims

Mercuric chloride catalyses the production of dialkyl phthalate esters from the reaction of a primary alkyl bromide and phthalic acid provided that the temperature is maintained in the range 155° to 180° C.

3,700,726

PROCESS FOR THE MANUFACTURE OF GLYCOL ETHER ACETATES

Sam H. Johnson, Jr., and Howard N. Wright, Jr., both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 19, 1971, Ser. No. 116,842
Int. Cl. C07c *67/02*
U.S. Cl. 260—491 10 Claims

A process for the production of glycol ether acetates according to the reaction:

$$R(OCH_2CH_2)_nOH + CH_3CO_2R' \overset{Catalyst}{\rightleftharpoons} CH_3CO_2(CH_2CH_2O)_nR + R'OH$$

wherein R and R′ represent the same or different aliphatic radicals with one to four carbon atoms and *n* is equal to 1 or 2. Preferred catalysts include aluminum alkoxide, titanium alkoxide and organo-metallic salts. The reaction is conducted at pressures from 25 psia to 150 psia and temperatures of from about 150° C. to about 225° C.

3,700,727

INTRODUCTION OF ORGANIC GROUPS INTO ETHYLENICALLY UNSATURATED ESTERS USING A GROUP VIII METAL SALT

Richard F. Heck, Wilmington, Del., assignor to Hercules Incorporated

Division of Ser. No. 479,665, Aug. 13, 1965, Pat. No. 3,527,794. This application Dec. 8, 1969, Ser. No. 883,288
Int. Cl. C07c *69/76*
U.S. Cl. 260—476 R 9 Claims

The process involves the introduction of an organic group into an ethylenically unsaturated carboxylic acid or nitrile or ester thereof. As an example, a mixture of phenylmercuric chloride, lithium palladium chloride and methyl acrylate is formed in acetonitrile as solvent. This results in the formation of an unstable adduct between the methyl acrylate and phenylpalladium chloride. Decomposition of the adduct by maintaining it above its decomposition temperature provides methyl cinnamate as the product.

3,700,728

SOLUBILIZATION OF HUMIC ACIDS, LIGNITES AND COALS

Speros E. Moschopedis; Ernst Czakert, and Stephen M. Creighton, all of Edmonton, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Dec. 30, 1968, Ser. No. 787,995
Claims priority, application Canada, Jan. 4, 1968, 9,114
Int. Cl. C07c *143/52*
U.S. Cl. 260—507 R 7 Claims

A process for the preparation of water-soluble products from humic acids, lignites and pre-oxidized coals which are reacted with a sulfonating agent to form a sulfite or a bisulfite in situ, in an alkaline medium. The water-soluble product is useable as a well-drilling fluid.

3,700,729

PREPARATION OF AROMATIC ACIDS

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 6, 1965, Ser. No. 512,012
Int. Cl. C07c *63/00, 63/06, 63/10*
U.S. Cl. 260—515 R 17 Claims

An aromatic acid is prepared by reacting in the liquid phase an aromatic with carbon monoxide in the presence of a catalyst selected from the group consisting of palladium and ferric chloride and bromides and mixtures thereof and an anhydrous organic liquid inert to the above reactants and catalyst at a temperature between about 100° C. and 300° C. and at a pressure to maintain liquid phase, and then hydrolyzing the resultant carbonylated compound to said aromatic acid.

3,700,730

2-CARBOXY OR 2-CARBOXYLOWER ALKYL DERIVATIVES OF 5-FLUORO-1-(P-METHYLSULFINYL-BENZYLIDINE)-INDENYL-3-ACETIC ACID

David F. Hinkley, Plainfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed May 1, 1970, Ser. No. 33,973
Int. Cl. C07c *147/00*
U.S. Cl. 260—515 A 4 Claims

Process for preparing 1-(p-methylsulfinylbenzylidene)-2-methyl-5-fluoro-3-indenylacetic acid by methylating 1-(p-methylsulfinylbenzylidene)-5-fluoro-3-indenylacetic acid or a derivative thereof. Also included are novel 1-(p-methylsulfinylbenzylidene)-5-fluoro-3-indenylacetic acid intermediates.

3,700,731

PROCESS FOR OXIDIZING XYLENES TO PHTHALIC ACIDS

Robert H. Sullivan, Woodbury, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. Nos. 667,646, Sept. 14, 1967, abandoned, and Ser. No. 742,150, July 3, 1968, abandoned. This application Feb. 28, 1969, Ser. No. 803,441

Int. Cl. C07c *63/02*

U.S. Cl. 260—524 R 10 Claims

Continuous process for the oxidation of xylenes with oxygen at about 105° to 150° C wherein xylene is added at the same rate as phthalic acid is formed and xylene and partially oxidized intermediates, including those entrained in the phthalic acid are recycled continuously, a critical hold-up time is exceeded and the reaction mixture contains at least about 0.1 mole percent xylene based on the total of xylene and its oxidation products.

3,700,732

N-(1,1-DIMETHYL-2-BUTYNYL)-3,5-DICHLOROBENZAMIDE

Colin Switchenbank, Parkasie, and Kenneth L. Viste, Warminster, both of Pa., assignors to Rohn and Hass Company, Philadelphia, Pa.

Filed March 26, 1969, Ser. No. 810,814

Int. Cl. C07c *103/30*

U.S. Cl. 260—558 D 1 Claim

Novel compounds which belong to the class of N-(1,1-dimethyl-2-alkynyl)-3,5-disubstituted and 3,4,5-trisubstituted benzamides. These compounds are potent herbicides.

3,700,733

PREPARATION OF POLYHALOISOALKOXYALKANOIC ACIDS AND DERIVATIVES THEREOF

Richard Francis Sweeney, Elma, N.Y., and Charles Cheng-Yu Yao, Long Valley, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 1, 1969, Ser. No. 862,953. The portion of the term of this patent subsequent to Feb. 3, 1987, has been disclaimed.

Int. Cl. C07c *51/58*

U.S. Cl. 260—544 F 30 Claims

Antimony pentahalides selected from the group $SbCl_5$, SbF_5 and SbF_3Cl_2 catalyze the oxidation of polyhaloisoalkoxy-alkyl iodides with SO_3 or oleum. The products of the reaction are the corresponding acid halides and pyrosulfuryl halides which may be converted to the free acids or acid derivatives. The acids, salts and esters thereof are surface active. The acids are further useful as stain repellent agents.

3,700,734

2'-HYDROXY-2,3,5-TRIMETHYL-6,7-BENZOMORPHAN

Franklin M. Robinson, Ambler, and Paul S. Anderson, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 23, 1969, Ser. No. 793,571

Int. Cl. C07d *39/00*

U.S. Cl. 260—293.54 1 Claim

Novel 2,3,5-trisubstituted-2'-hydroxy-6,7-benzomorphan compounds, their methods of preparation and their use as effective analgesic agents is described.

3,700,735

METHYLACETYLENE CHLORINATION

Chester E. Pawloski, Bay City, and Russell L. Stewart, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed April 22, 1968, Ser. No. 723,242The portion of the term of this patent subsequent to May 16, 1989, has been disclaimed.

Int. Cl. C07c *45/06*

U.S. Cl. 260—597 R 7 Claims

1,1-Dichloro-2-propanone is produced by a process comprising reacting by contacting methylacetylene with chlorine in the presence of water, preferably at a temperature between 50° and 105° C. The product is biologically active.

3,700,736

PREPARATION OF P-METHYLSULFONYL BENZALDEHHYDE

Michihiro Yamamoto, Takarazuka-shi, and Kozo Shimago, Minoo-shi, both of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed July 16, 1969, Ser. No. 842,392

Int. Cl. C07c *147/06*

U.S. Cl. 260—607 A 3 Claims

Para-methylsulfonylbenzaldehyde is readily produced by reacting methyl para-tolyl sulfone with bromine under heating to prepare novel para-methylsulfonylbenzylidene bromide, and subsequently hydrolyzing the resultant para-methylsulfonylbenzylidene bromide.

Para-methylsulfonylbenzaldehyde is useful as an intermediate for the production of medicines such as thiamphenicol.

3,700,737

PERFLUOROALKYL VINYL SULFONES

Ronald A. Mitsch, and Robert J. Koshar, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 732,865, May 29, 1968, Pat. No. 3,578,717. This application Dec. 14, 1970, Ser. No. 98,096

Int. Cl. C07c *147/02*

U.S. Cl. 260—607 A 1 Claim

Perfluoroalkyl vinyl sulfones, $CF_3SO_2CH{=}CH_2$ and higher, are provided which are homopolymerized to oligomers in the presence of tertiary amine basic catalysts.

3,700,738

3-(P-SUBSTITUTED PHENYL) PROPANE-1,2-DIOLS

Peter Thomas Bysouth, and Anthony Musgrave Wild, both of London, England, assignors to BDH Pharmaceuticals Limited, Edinburgh, Scotland

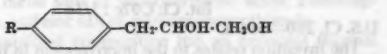
Filed July 23, 1970, Ser. No. 57,803

Claims priority, application Great Britain, July 30, 1969, 38,250/69

Int. Cl. C07c *31/16, 43/20*

U.S. Cl. 260—613 R 6 Claims

3-(p-Substituted phenyl) propane-1,2-diols of the formula



where R is phenyl, alkoxyphenyl, phenoxy or cycloalkenyl are disclosed. These compounds are useful as anti-inflammatory agents.

3,700,739

FLAME RETARDANT COMPOSITIONS

Erich Kuehn, Wilmington, Del., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.

Division of Ser. No. 728,913, May 14, 1968, Pat. No. 3,644,599. This application Feb. 19, 1971, Ser. No. 117,038

Int. Cl. C07c *43/28*

U.S. Cl. 260—613 R 9 Claims

Polyol adjuvants are provided which have the property of imparting flame-retardant characteristics to polyurethane foams. The adjuvants are prepared by condensing at least one mole of 3-halo-1,2-propanediol and at least one mole of 1,3-dihalo-2-propanol with a tetrahalo bisphenol A or, alternatively, with the reaction product of at least one mole of a phenol, a chlorophenol and at least one mole of the same or another phenol with at least one mole of formaldehyde. The condensa-

tion products are subsequently reacted with the salt of a saturated or unsaturated partial ester of phosphoric acid and optionally brominated in the latter case. Flame-retardant polyurethane foams are disclosed containing the novel polyol adjuvants.

3,700,740

PROCESS FOR PRODUCING ACETYLENIC ALCOHOLS

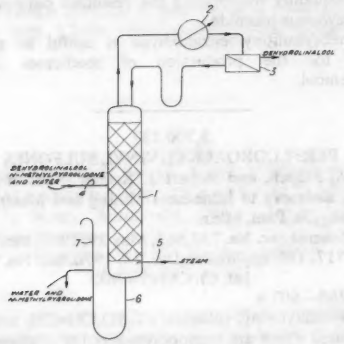
Emile Mourier, 35 rue du 8 mai 1945, Villeurbanne, France

Filed Jan. 30, 1969, Ser. No. 795,256

Claims priority, application France, Jan. 31, 1968, 68138158

Int. Cl. C07c *33/04, 35/08, 29/26*

U.S. Cl. 260—631.5 **2 Claims**



Acetylenic alcohols especially dehydrolinalool are produced by reaction of a ketone with acetylene in N-methylpyrrolidone in the presence of sodium hydroxide. The resulting mixture of dehydrolinalool and N-methylpyrrolidone is preferably separated by distillation through a column and washing the vapors with water.

3,700,741

PROCESS FOR CYCLOPENTADIENE DIMERIZING

Jean Aubry, and Emile Yax, both of Moselle, France, assignors to Societe Chimique des Charbonnages Tour Aurore, Courlevoie, France

Filed June 2, 1971, Ser. No. 149,326

Claims priority, application France, June 3, 1970, 7020437

Int. Cl. C07c *13/14*

U.S. Cl. 260—666 A **2 Claims**

The invention relates to the improvement in the process of thermally dimerizing a concentrated cyclopentadiene monomer feed said improvement consisting in introducing said feed in a single reactor at atmospheric pressure, heating same to the boiling temperature of said feed, maintaining slight reflux conditions, letting the temperature increase from said boiling temperature to the boiling temperature of substantially pure dicyclopentadiene, stopping the reaction and recovering said substantially pure dicyclopentadiene.

3,700,742

AROMATIC HYDROGENATION PROCESS

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 855,725, Sept. 5, 1969, Pat. No. 3,617,510, which is a continuation-in-part of Ser. No. 839,086, July 3, 1969, abandoned. This application April 26, 1971, Ser. No. 137,615

Int. Cl. C07c *5/10*

U.S. Cl. 260—667 R **8 Claims**

A process for hydrogenating hydrocarbons and mixtures of hydrocarbons utilizing a catalytic composite of a porous carrier material, a rhenium component, a germanium component and a Group VIII noble metal component. A specific example of one such process involves the hydrogenation of benzene to produce cyclohexane.

3,700,743

CONVERSION OF DIACETYLBENZENES TO UNSATURATED DERIVATIVES

Howard M. Relles, Rexford, N.Y., assignor to General Electric Company

Filed Aug. 26, 1970, Ser. No. 67,212

Int. Cl. C07c *15/04*

U.S. Cl. 260—668 R **6 Claims**

The use of a solvent mixture consisting essentially of from 30–70 volume percent dichloromethane with the balance being chloroform, has a profound beneficial effect on the yield of the β, β'-dichlorobenzenediacrolein obtained by reaction of the complex of phosgene and N,N-dimethyl-formamide with m- or p-diacetylbenzene. The diacrolein products are readily converted to the corresponding diethynylbenzenes which are useful in the making of acetylenic polymers and copolymers.

3,700,744

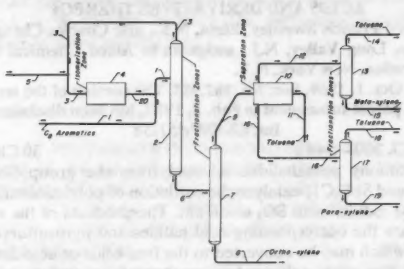
SIMULTANEOUS RECOVERY AND PRODUCTION OF PURE XYLENES FROM A C AROMATIC MIXTURE

Charles V. Berger, and Donald B. Broughton, both of 30 Algonquin Road, Des Plaines, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Sept. 18, 1970, Ser. No. 73,467

Int. Cl. C07c *15/08*

U.S. Cl. 260—668 A **12 Claims**



Each xylene isomer, in relatively pure form, is recovered and produced from a C_8 mixture containing the same and ethylbenzene by a combination of fractionation and selective zeolitic molecular sieve separation involving fractionation of a C_8 aromatic stream to produce an ortho-xylene free, ethylbenzene, meta-xylene and para-xylene fraction for subsequent isomerization, a relatively pure ortho-xylene fraction and a mixed, ortho-xylene and ethylbenzene free, meta-xylene and para-xylene fraction which is further separated by selective zeolitic adsorption.

3,700,745

HYDRODEALKYLATION PROCESS WITH PROMOTED GROUP VIII METALS

Stephen M. Kovach, Ashland; Ralph E. Patrick, Flatwoods, and Ronald A. Kmecak, Ashland, all of Ky., assignors to Ashland Oil Inc.

Filed Oct. 22, 1968, Ser. No. 769,729

Int. Cl. B01j *11/06;* **C07c** *3/58*

U.S. Cl. 260—672 R **4 Claims**

A hydrodealkylation process comprising contacting alkyl aromatic hydrocarbons with a catalyst, including an active Group VIII metal, such as, platinum, rhodium, palladium, ruthenium and nickel, a promoter selected from the group of alkali, alkaline earth and rare earth metals, such as, potassium,

rubidium, cesium, calcium, strontium, cerium and thorium, and an inert oxide support such as, gamma aluminas, silica-alumina, silica, silica-magnesia, alumina-magnesia and silica-zirconia at a temperature of 1,050° to 1,200° F, a pressure of 100 to 1,000 psig., a liquid hourly space velocity of 0.1 to 5 and a hydrogen-to-hydrocarbon mole ratio of 3–15/1.

3,700,746

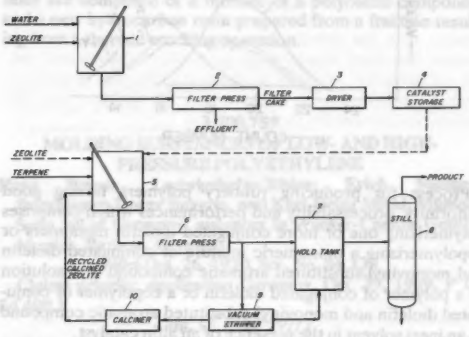
ISOMERIZATION OF ALPHA-PINENE

Edward Andrew Takacs, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 845,432, July 28, 1969, abandoned. This application April 1, 1971, Ser. No. 130,120

Int. Cl. C07c *13/00;* **C09f** *3/02;* **C01b** *33/28*

U.S. Cl. 260—675.5 **10 Claims**



A method for producing dipentene is given whereby a pinene-containing feed is isomerized at high temperatures in the presence of a small amount of a molecular sieve zeolite catalyst of the 13X-type which can be represented as follows:

$$1.0\pm0.2\ M_2O : Al_2O_3 : 2.5\pm0.5\ SiO_2 : y\ H_2O$$

wherein M is an alkali metal and y is a value from 0 to 8.

3,700,747

ISOMERIZATION OF TERPENES

Edward Andrew Takacs, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 845,432, July 28, 1969, abandoned. This application April 6, 1971, Ser. No. 131,831

Int. Cl. C07c *13/00;* **C09f** *3/02;* **C01b** *33/28*

U.S. Cl. 260—675.5 **10 Claims**

A method for producing terpinolene is given whereby a terpene-containing feed is isomerized in the presence of a small amount of an alkali metal zeolite molecular sieve catalyst of the 13X-type.

3,700,748

SELECTIVELY HYDROGENATED BLOCK COPOLYMERS

De Loss E. Winkler, Orinda, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed May 22, 1970, Ser. No. 39,919

Int. Cl. C08f *19/08 , 27/24*

U.S. Cl. 260—879 **8 Claims**

Block polymers are provided having substantially improved capability of forming stable elastomeric polar derivatives, these block polymers being prepared by block polymerizing a monovinyl arene with butadiene, the butadiene block containing between about 8 and about 80 percent 1,2-structure and thereafter selectively hydrogenating so as to substantially eliminate the unsaturation in the pendant vinyl groups.

3,700,749

DEHYDROGENATION PROCESS OVER PLATINUM ON LITHIATED MORDENITE

John K. Robinson, Houston, Tex., and Hervey H. Voge, Berkeley, Calif., assignors to Shell Oil Company, New York, N.Y.

Filed June 24, 1971, Ser. No. 156,494

Int. Cl. C07c *5/18*

U.S. Cl. 260—683.3 **8 Claims**

Normal alkanes containing from six to 16 carbon atoms are selectively dehydrogenated to mono-alkenes and side reactions are minimized by contacting a hydrocarbon feedstock with a noble metal catalyst supported on a lithiated synthetic mordenite in the presence of hydrogen under appropriate dehydrogenation conditions.

3,700,750

STABILIZED POLYPHENYLENE OXIDE COMPOSITION

Saburo Yamanouchi, Kobe; Kiyoshi Yasuno, Ibaragi; Kou Sota, Yamatokohriyama, and Takuzo Okumura, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

Filed Dec. 29, 1970, Ser. No. 102,509

Claims priority, application Japan, Jan. 7, 1970, 45/2630; Jan. 9, 1970, 45/3087

Int. Cl. C08g *43/02;* **C08d** *9/10*

U.S. Cl. 260—874 **13 Claims**

A stabilized composition of modified polyphenylene oxide comprising a graft polymer obtained by polymerizing a styrene-type compound in the presence of a polyphenylene oxide with or without a rubber-like polymer and incorporated with (a) 0.1 to 10 percent, preferably 0.5 to 7 percent by weight of a sterically hindered phenol and (b) 0.1 to 10 percent, preferably 0.5 to 7 percent by weight of at least one compound selected from the group consisting of thioethers of carboxylic acid esters, trialkyl or triaryl phosphites, trialkyl or triaryl thiophosphites, and arylamines; or alternatively, incorporated with (c) 0.1 to 10 percent, preferably 0.5 to 7 percent by weight of at least one compound selected from the group consisting of metal salts of dithiocarbamic acids, 2-mercaptoimidazoline, and zinc salt of mercaptobenzothiazole.

The said stabilized composition has an excellent thermal stability and its impact resistance will hardly be deteriorated when heated at high temperatures for a long period of time.

3,700,751

MOLDING MATERIAL FROM POLYAMIDE AND ACRYLIC ESTER OF A T-ALIPHATIC ALCOHOL

Gerhard Mueller, 40 Kastanienweg, Wesseling; Helmut Doerfel, 7 Edenkobener Strasse, Ludwigshafen/Rhein, and Georg Schmidt-Thomee, 5 Werrgasse, Heidelberg, all of Germany

Filed June 11, 1968, Ser. No. 735,961

Claims priority, application Germany, June 19, 1967, P 16 69 702.2

Int. Cl. C08g *41/04*

U.S. Cl. 260—857 L **5 Claims**

Impact-resistant thermoplastic molding material based on polyamides and olefin polymers and methods for the production of the same by mixing polyamides and copolymers of an olefin and an acrylic and/or methacrylic ester of a tertiary alcohol under the action of shearing forces with simultaneous removal of gaseous elimination products.

3,700,752

GEL POLYMERIZED POLYURETHANE PRECURSORS AND VINYL MONOMERS

Francis Gowland Hutchinson, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 13, 1970, Ser. No. 2,641

Claims priority, application Great Britain, Jan. 27, 1969, 4,446/69

Int. Cl. C08g 41/04

U.S. Cl. 260—859 R 36 Claims

A process for the preparation of shaped polymeric articles by gel-polymerizing a homogeneous composition comprising from 5 to 95% by weight of the precursors of a cross-linked polyurethane and from 95 to 5% by weight of at least one vinyl monomer in which the gelatin of the polyurethane is substantially completed before polymerization of the vinyl monomer is allowed to proceed to the extent that the vinyl polymer so produced forms a separate phase, and thereafter completing polymerization of the vinyl monomer; also shaped polymeric articles comprising a homogeneous dispersion of from 5 to 95% by weight of a cross-linked polyurethane and from 95 to 5% by weight of a polymer of at least one vinyl monomer.

3,700,753

POLYMER COMPOSITIONS COMPRISING POLYETHYLENE AND ETHYLENE/PROPYLENE COPOLYMER

Hiroshi Terada, and Kenzo Shirayama, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 735,573, June 10, 1968, abandoned. This application Sept. 8, 1970, Ser. No. 70,579

Claims priority, application Japan, June 28, 1967, 42/41829

Int. Cl. C08f 29/12

U.S. Cl. 260—876 B 5 Claims

A polymer composition consisting of 70–99.5 percent by weight of low density polyethylene having a density of 0.940 or less and 0.5–30 percent by weight of a substantially amorphous propylene-ethylene copolymer having an ethylene content of 20 percent by weight or less, an intrinsic viscosity in tetralin at 135° C. in the range of 1.0–2.8 and a crystallinity of 35 percent by weight or less according to ordinary X-ray analysis.

This composition improves the high speed processability of the low density polyethylene.

3,700,754

COMPOSITIONS OF POLYMERS OF METHYL METHACRYLATE AND POLYMERS OF ETHYLENE

Joseph Michael Schmitt, Ridgefield; Jeffrey Rufus Sherry, Danbury, and Albert George Robustelli, Norwalk, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 817,155, April 17, 1969, abandoned, which is a continuation-in-part of Ser. No. 618,107, Feb. 23, 1967, abandoned. This application Sept. 8, 1970, Ser. No. 70,572

Int. Cl. C08f 1/60, 15/00

U.S. Cl. 260—878 R 7 Claims

This invention relates to a process for the production of transparent, high impact, molding compositions of matter comprising (1) a polymer of methyl methacrylate with or without comonomers copolymerizable therewith and (2) a copolymer of ethylene having grafted thereon the monomers of (1) and to weatherable modifications thereof.

3,700,755

PROCESS FOR PRODUCING RUBBERY POLYMERS

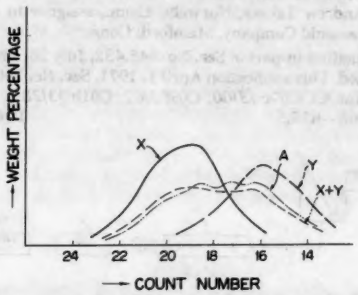
Koretaka Yamaguchi, Kawasaki-shi; Kazuo Toyomoto, Yokohama-shi, and Kuniaki Sakamoto, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed April 15, 1969, Ser. No. 816,233

Claims priority, application Japan, April 27, 1968, 43/27997

Int. Cl. C08f 19/02, 19/08, 1/58

U.S. Cl. 260—879 10 Claims



Process for producing rubbery polymers having good uniformity, processability and performances which comprises polymerizing one or more conjugated diolefin monomers or copolymerizing a monomeric mixture of conjugated diolefin and monovinyl-substituted aromatic compound in a solution of a polymer of conjugated diolefin or a copolymer of conjugated diolefin and monovinyl-substituted aromatic compound in an inert solvent in the presence of an alfin catalyst.

3,700,756

CATALYTIC BLOCK COPOLYMERIZATION OF POLAR MONOMERS

Theodore F. Niemann, Brecksville, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Division of Ser. No. 862,962, Oct. 1, 1969, Pat. No. 3,609,101. This application Feb. 17, 1971, Ser. No. 116,237

Int. Cl. C08f 15/38, 15/16, 15/22

U.S. Cl. 260—881 7 Claims

Polar monomers can be copolymerized to obtain block copolymers by the sequential addition of the polar monomers when the polymerization is initiated with an organolithium compound in combination with a compound containing a sulfinyl or sulfonyl group. Acrylonitrile, methacrylonitrile and alkyl acrylates and methacrylates are copolymerized to two- and three-block copolymers with alkyl lithium-diphenyl sulfone or alkyl lithium-diphenyl sulfoxide initiator systems.

3,700,757

PROCESS FOR THE PREPARATION OF GEL-CONTAINING SYNTHETIC CONJUGATED DIENE SOLUTION POLYMERS

Gerardus E. La Heij, and Gerrit J. Van Amerongen, both of Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Division of Ser. No. 797,712, Feb. 7, 1969, Pat. No. 3,642,762. This application June 30, 1971, Ser. No. 158,543

Claims priority, application Great Britain, March 15, 1968, 12,779/68

Int. Cl. C08d 9/16, 5/02, 5/04

U.S. Cl. 260—894 3 Claims

Conjugated diene solution rubber compositions having improved green strength combined with satisfactory processa-

bility are obtained by treatment of a solution diene rubber, in aqueous dispersion, with a redox hydroperoxide system to produce a composition having 5–60 weight percent toluene-insoluble gel.

3,700,758

HOT MELT ADHESIVE COMPOSITIONS COMPRISING POLYOLEFIN AND DAC-B RESIN

Sam H. Johnson, Jr.; Robert A. Mears, and Vernon K. Park, all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 27, 1970, Ser. No. 67,563
Int. Cl. C08f *29/12*
U.S. Cl. 260—897 R **9 Claims**

Improved hot melt adhesives and processes for their preparation are disclosed. These hot-melt adhesive compositions are composed of a mixture of a polyolefin component and a new hydrocarbon resin prepared from a fraction resulting from a thermal cracking operation.

3,700,759

MOLDING SUBSTANCES OF LOW- AND HIGH-PRESSURE POLYETHYLENE

Hans Breuer, Ludwigshafen/Rhine; Erich Manner, Burghausen-Upper Bavaria, and Karl-Heinz Michl, Munich-Solln, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Bavaria, Germany

Filed Oct. 26, 1970, Ser. No. 84,239
Claims priority, application Germany, Oct. 29, 1969, P 19 54 488.8
Int. Cl. C08f *29/12*
U.S. Cl. 260—897 A **1 Claim**

A molding substance consisting of 90 to 99 percent by weight of low-pressure polyethylene with a density of 0.940 to 0.965 and a grader value of 0.05 to 0.3, and 1 to 10 percent by weight of high pressure polyethylene with a density of 0.918 to 0.930 and a grader value of 0.05 to 0.3.

3,700,760

DIESTERS OF HALO-SUBSTITUTED ALKYLOXYALKYLPHOSPHONATES

Isaac Benghiat, New City, N.Y., assignor to Universal Oil Products Company, Des Plains, Ill.

Filed Dec. 29, 1969, Ser. No. 888,966
Int. Cl. C07f *7/40*; D06c *27/00*
U.S. Cl. 260—950 **6 Claims**

Novel compositions of matter comprising diesters of halo-substituted alkyloxyalkylphosphonates containing at least two halogen atoms as exemplified by dimethyl 3-chloro-2,3-dibromopropoxymethylphosphonates are utilized as components in preparing compounds such as plastics, polymers, resins, etc. and will impart desirable physical characteristics of flame retardance or fire resistance to these compounds.

ERRATUM

For Class 260—404 see:
Patent No. 3,700,844

ERRATUM

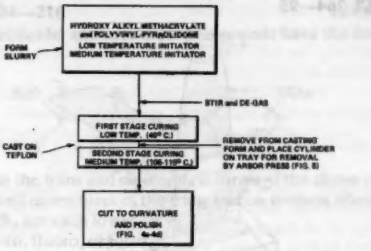
For Class 260—31 see:
Patent No. 3,700,957

3,700,761

FABRICATION OF SOFT PLASTIC CONTACT LENS BLANK

Kenneth F. O'Driscoll, Williamsville, and Allan A. Isen, Buffalo, both of N.Y., assignors to Griffin Laboratories Incorporated, Buffalo, N.Y.

Filed Nov. 28, 1969, Ser. No. 880,828
Int. Cl. B29d *11/00*
U.S. Cl. 264—1 **8 Claims**


HYDROXY ALKYL METHACRYLATE and POLYVINYL-PYRROLIDONE
LOW TEMPERATURE INITIATOR
MEDIUM TEMPERATURE INITIATOR
FORM SLURRY
STIR and DE-GAS
FIRST STAGE CURING LOW TEMP. (40° C.)
CAST ON TEFLON
SECOND STAGE CURING MEDIUM TEMP. (105-110° C.)
REMOVE FROM CASTING FORM AND PLACE CYLINDER ON TRAY FOR REMOVAL BY ARBOR PRESS (FIG. 5)
CUT TO CURVATURE AND POLISH
(FIG. 4a-4d)

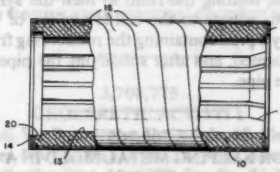
Graft or block copolymers of hydroxy alkyl methacrylate esters and polyvinyl pyrrolidone are (1) cast in a shaping mold as a monomer-polymer dispersion, polymerized to a solid at 40°–60° C. in the presence of low and medium temperature free radical initiators, (2) the solid taken out of the mold and heated to 90°–120° C., and then post-polymerized by (3) radiation while dry and by (4) hydrogen peroxide treatment to form hygroscopic, solid, shaped masses which may be cut in the dry state, after step (2), into contact lenses. The lenses may be equilibrated in the wet state by hydrating with normal saline solution. The lenses may be maintained by treatment with hydrogen peroxide. Steps (3) and (4) toughen the lens, increase its elasticity and its elastic recovery and improve its dimensional stability. From 20 to 45 percent by weight of polyvinyl pyrrolidone imparts hygroscopic and unusual water-swelling characteristics while retaining elastic recovery. The water-swollen lens contains from 40–80 percent water, preferably from 50–55 percent, and in isotonic saline, the water content changes to about 52–58 percent. As a result of the polyvinyl pyrrolidone incorporation, the lens is readily cleaned after use in the eye with dilute hydrogen peroxide to rid it of imbibed muco-protein, catalase and the like.

3,700,762

PROPELLANT GRAIN

David W. Carpenter, and Charley R. Rodgers, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed May 4, 1070, Ser. No. 34,032
Int. Cl. C06b *21/02*
U.S. Cl. 264—3 **2 Claims**

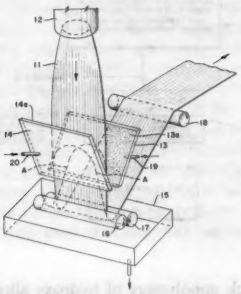


A propellant grain is wrapped with glass fiber tape and fitted with epoxy end pieces to inhibit burning in those areas. A fluorocarbon grain is etched with hydrochloric acid and then immersed in lacquer before being wrapped.

3,700,763
TUBULAR WATER QUENCH PROCESS WITH WATER FILM COOLING

Peter H. van Kralingen, Delft, Netherlands, assignor to Shell Oil Company, New York, N.Y.

Filed Aug. 13, 1969, Ser. No. 849,849
Claims priority, application Great Britain, Dec. 31, 1968, 61,899/68
Int. Cl. B29c 17/07, 25/00; B29d 7/20
U.S. Cl. 264—95 4 Claims



Film of an organic thermoplastic polymer is manufactured by drawing an extruded, inflated, hot, tubular film from an extruder and passing the film into contact with layers of cooling liquid supported by symmetrically disposed collapsing elements adapted to effect a partial but not complete collapse of the tubular film to the lay flat form, cooling liquid being simultaneously supplied to a plurality of locations distributed over the surfaces of the collapsing elements at a rate sufficient to maintain layers of cooling liquid thereon.

3,700,764
PROCESS FOR THE PRODUCTION OF SYNTHETIC RESIN PIPES

Satoshi Tago, Yokkaichi, Japan, assignor to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1970, Ser. No. 101,667
Claims priority, application Japan, Dec. 27, 1969, 44/104952
U.S. Cl. 264—273 2 Claims

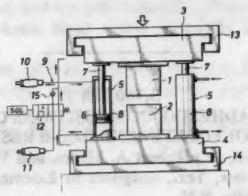
A process for the production of pipes having excellent anti-flattening characteristics under a load comprises the steps of placing in a metallic mold capable of being rotated, a reinforcing frame having a shape capable of being rotated in the metallic mold by rotation of the same and a powdered synthetic resin, heating the resin to melt the synthetic resin and cause it to adhere to the inside surface of the metallic mold, whereby a pipe containing the reinforcing frame material therein is formed, and after solidifying the pipe by cooling, recovering the pipe.

3,700,765
METHOD FOR KEEPING METAL MOLD IN A CLAMPED STATE

Katashi Aoki, 6037 Oaza Minamijo, Hanishina-gun, Japan

Filed May 20, 1971, Ser. No. 145,385
Claims priority, application Japan, May 30, 1970, 45/46688
Int. Cl. B29f 1/06; B30b 15/16
U.S. Cl. 264—328 1 Claim

A method and device for keeping metal mold in a clamped state characterized in that the mold-halves of the metal mold are respectively coupled to a plurality of hydraulic cylinders and pistons, the mold-halves are forced to close so that the displacement of the pistons causes a hydraulic fluid to flow from one space to the other in the hydraulic cylinders and also to an accumulator through a control valve, and upon the completion of the closure, shifting the control valve to another position so that the remaining fluid in the above mentioned one space is further evacuated to another accumulator at a low pressure with the simultaneous communication maintained between the other space of the hydraulic cylinders and the first accumulator, whereby a pressure difference is created between the two spaces separated by the pistons, and the mold-halves are thereby clamped.



3,700,766
METHOD FOR PRODUCING SOLUTIONS OF HIGH ALUMINA CONCENTRATION BY ALKALINE EXTRACTION OF ALUMINUM-CONTAINING OIL SHALE

Robert T. MacMillan, Silver Spring, Md., and Jesse Jackson, Jr., Washington, D.C.

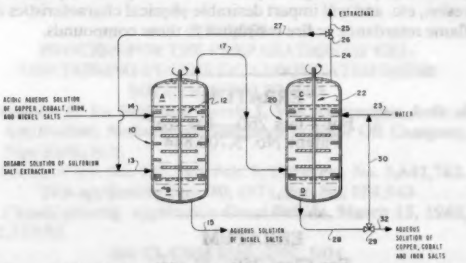
Continuation-in-part of Ser. No. 861,162, Sept. 25, 1969, abandoned. This application Aug. 16, 1971, Ser. No. 172,204
Int. Cl. C01f 7/02
U.S. Cl. 423—119 10 Claims

Aluminum values are leached from retorted oil shale with 0.5N to 1N sodium hydroxide solution present in sufficient quantity such that the mol ratio between sodium in the solution and aluminum in the shale is in a range of 2:1 to 2.5:1 ($Na_2O:Al_2O_3$). As pH falls to 12 during extraction, the liquid is fortified with additional NaOH to raise pH above 12. Mol ratio between said additional NaOH and undissolved aluminum, expressed as $Na_2O:Al_2O_3$, is in a range of 1:3 to 1:1.

3,700,767
RECOVERY OF SULFONIUM SALT EXTRACTING AGENTS

Jan P. Campen, and Riekert Kok, both of Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed April 23, 1971, Ser. No. 136,961
Claims priority, application Great Britain, May 4, 1970, 21,259/70
Int. Cl. C01g 3/04, 49/10, 9/04
U.S. Cl. 423—24 4 Claims


EXTRACTANT
ACIDIC AQUEOUS SOLUTION OF COPPER, COBALT, IRON, AND NICKEL SALTS
ORGANIC SOLUTION OF SULFONIUM SALT EXTRACTANT
WATER
AQUEOUS SOLUTION OF NICKEL SALTS
AQUEOUS SOLUTION OF COPPER, COBALT AND IRON SALTS

Recovery by hydrolysis of sulfonium salt extracting agents from metal value separation streams is improved when a portion of the aqueous hydrolysis effluent is recycled.

3,700,768

ANTIBIOTIC AM374 AND METHOD OF PRODUCTION USING STREPTOMYCES EBUROSPOREUS

Martin Paul Kunstmann, Pearl River, N.Y., and John Norman Porter, Ramsey, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 815,652, April 14, 1969, abandoned. This application April 6, 1970, Ser. No. 26,101
Int. Cl. A61k *21/100*
U.S. Cl. 424—118 6 Claims

A new antibiotic is produced, designated AM374, by fermenting under controlled conditions *Streptomyces eburosporeus* n.s. The new antibiotic is active against gram-positive bacteria and thus is useful in inhibiting the growth of such bacteria wherever they may be found.

The invention also relates to a novel use of the new antibiotic as a growth promoter for animals.

3,700,769

ANTIFUNGAL BH890

John Henry Edward James Martin, New City, N.Y., and John Norman Porter, Ramsey, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed April 14, 1969, Ser. No. 815,610
Int. Cl. A61k *21/00*
U.S. Cl. 424—119 3 Claims

A new antifungal compound, designated BH890, is produced by cultivating a new strain of *Streptomyces misionensis* NRRL 3609. The new antifungal can be used to inhibit growth of a variety of fungi, as, for example, *Candida albicans* and *Cryptococcus neoformans*.

3,700,770

PHENYLALANINE DERIVATIVES FOR TREATMENT OF MEASLES INFECTIONS

Ernest D. Nicolaides, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed Oct. 21, 1966, Ser. No. 588,306
Int. Cl. A61k *27/00*
U.S. Cl. 424—177 5 Claims

Pharmaceutical compositions in dosage unit form comprising a pharmaceutical carrier and N-carbobenzoxy-D-phenylalanyl-D-phenylalanine or a pharmaceutically-acceptable salt. Methods for the prophylaxis or treatment of measles infections, by administering N-carbobenzoxy-D-phenylalanyl-D-phenylalanine or a pharmaceutically-acceptable salt.

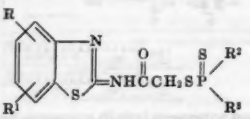
3,700,771

2-AMINOBENZOTHIAZOL PHOSPHATES AND PHOSPHONATES USED AS INSECTICIDES

Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Division of Ser. No. 837,880, June 30, 1969, Pat. No. 3,597,439. This application Feb. 16, 1971, Ser. No. 115,871
Int. Cl. A01n *9/36*
U.S. Cl. 424—200 7 Claims

Compounds of the formula



in which R and R^1 are hydrogen or halogen, R^2 is alkoxy, and R^3 is alkoxy or alkyl, are used as insecticides.

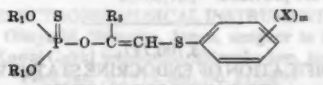
3,700,772

PHENYLTHIOVINYL PHOSPHOROTHIOATES AS INSECTICIDES AND ACARICIDES

Roger Williams Addor, Pennington, and Thomas Walter Drabb, Jr., Trenton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 808,006, March 17, 1969, Pat. No. 3,632,862. This application May 17, 1971, Ser. No. 144,406
Int. Cl. A01b *9/36*
U.S. Cl. 424—216 10 Claims

The insecticidal and acaricidal compounds have the formula:



and include the trans and cis isomeric forms of the above compound as well as mixtures of the trans and cis isomers wherein:

R_1, R_2,$8R_3$ are each lower alkyl,

X is chloro, fluoro, or nitro,

m is 0 or 1, except that when X is chloro, *m* is 1 to 3.

The compounds are prepared by reaction of an α-phenylthioketone with a phosphorothioate compound in the presence of an inert reaction solvent and certain strong bases.

3,700,773

SUBSTITUTED PHENYLSULFAMYL SALICYCLIC ACIDS AND DERIVATIVES THEREOF IN THE TREATMENT OF INFLAMMATION

Tsung-Ying Shen; Bruce E. Witzel, and Gordon L. Walford, all of Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed June 25, 1969, Ser. No. 836,605
Int. Cl. A61k *27/00*
U.S. Cl. 424—230 4 Claims

Substituted phenyl sulfamyl or sulfonamido salicylic acids and non-toxic pharmaceutical accepted salts, esters, amides and various derivatives thereof are claimed. Also a method of treating inflammation which comprises administering various substituted phenyl sulfamyl or sulfonamido salicylic acids and the various derivatives are also claimed. The substituted phenyl sulfamyl or sulfonamido salicylic acids described herein have anti-inflammatory, anti-pyretic and analgesic activity.

3,700,774

DIAZEPAM AND PROPANTHELINE COMPOSITION

Irwin Lerner, West Caldwell, and Robert Paul McGrath, Wayne, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 793,546, Jan. 23, 1969, abandoned. This application Oct. 30, 1970, Ser. No. 85,746
Int. Cl. A61k *27/00*
U.S. Cl. 424—244 4 Claims

Compositions comprising diazepam and propantheline halide, useful in treating gastrointestinal disorders are disclosed.

3,700,775

CHOLERETIC ACTIVITY

Luigi Turbanti, Via Bonaccorso Da Padule, 10, Pisa, Italy

Division of Ser. No. 632,563, April 21, 1967, abandoned. This application Sept. 11, 1970, Ser. No. 71,359
Int. Cl. A61k *27/00*
U.S. Cl. 424—317 3 Claims

This invention provides 2-phenyl-2-hydroxy-cyclohexanecarboxylic acid and 2-cyclohexyl-2-hydroxy-cyclohexane-carboxylic acid as highly effective choleretic agents. The administration of effective dosages of these compounds by various routes results in marked choleresis.

3,700,776

USE OF P,P'-BIS-UREIDODIPHENYL SULFONE IN TREATING MAREK'S DISEASE

Tsung-Ying Shen, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed March 10, 1970, Ser. No. 18,293
Int. Cl. A61k *27/00*
U.S. Cl. 424—322 **12 Claims**

The use of p,p'-bis-ureidodiphenyl sulfone and soluble salts thereof in reducing mortality and decreasing lesion incidence of poultry exposed to Marek's disease and to compositions comprising the p,p'-bis-ureidodiphenyl sulfone as the active ingredient are provided.

3,700,777

MODIFICATION OF ENDOCRINE STATUS WITH HYDRAZINE DERIVATIVES

Dora Nellie Richardson; Arthur Leonard Walpole, both of Macclesfield, and George Edward Paget, Welwyn Garden City, all of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 32,589, May 31, 1960, abandoned, and a continuation of Ser. No. 378,966, June 29, 1964, abandoned. This application Aug. 8, 1969, Ser. No. 851,143
Claims priority, application Great Britain, June 17, 1957, 20,758/57; Nov. 23, 1959, 39627/59
Int. Cl. A61k *27/00*
U.S. Cl. 424—323 **19 Claims**

The disclosure relates to pharmaceutical and veterinary compositions containing as active ingredient at least one N^1,N^2-dithiocarbamoylhydrazine derivative, and to a method for using such compounds for the modification of the endocrine status in humans and in animals. Typical of the active ingredients used is N^1-α-methylallylthiocarbamoyl-N^2-methylthiocarbamoylhydrazine.

3,700,778

INSECTICIDAL COMPOSITION CONTAINING TRIFLUOROMETHYL SUBSTITUTED BENZANILIDES AND METHOD OF USING THE SAME

Harry L. Hyndman, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed July 23, 1970, Ser. No. 57,790
Int. Cl. A01n *9/20*
U.S. Cl. 424—324 **16 Claims**

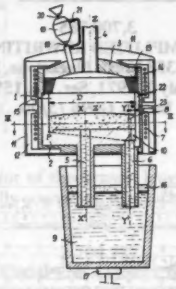
Insecticidal compositions and methods utilizing benzanilides having a trifluoromethyl group on either of the benzene rings.

ELECTRICAL

3,700,779
METHOD OF TREATMENT OF LIQUID STEEL UNDER VACUUM

Jacques Pomey, Billancourt, France, assignor to Societe des Aciers Fins de l'Est, Billancourt, France

Division of Ser. No. 744,744, July 15, 1968. This application July 30, 1970, Ser. No. 64,896
Int. Cl. H05b 5/16
U.S. Cl. 13—26 **8 Claims**

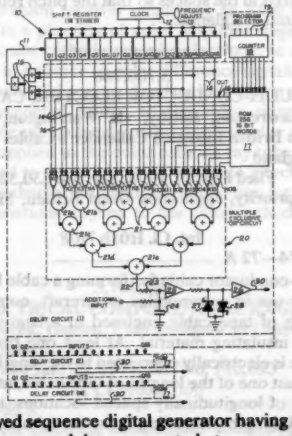


A method of de-gasification of steel in fusion poured into a casting ladle in which are immersed the lower extremities of two vertical refractory pipes, the upper parts of which open into the bottom of a vacuum-tight refractory chamber, the one in the proximity of its center and the other into its peripheral portion, a constant vacuum ensuring the rise of the steel bath and its stabilization at a pre-determined height being maintained in said chamber, the steel being heated by induction, a circulation of the liquid steel through the pipes between the ladle and the chamber being effected by means of an inductor winding surrounding the chamber and for a period sufficient for the desired degree of purification under vacuum to be obtained.

3,700,780
DUAL DELAYED SEQUENCE GENERATOR WITH READ ONLY MEMORY CONTROL FOR 256 OUTPUT TRIPLES FOR PLANE AND SPHERICAL WAVE-FRONT SIMULATIONS

Eugene R. Roeschlein, Indianapolis, Ind., assignor to The United States of America as represented by the Secretary of the Navy

Filed May 4, 1971, Ser. No. 140,167
Int. Cl. G09b 9/00
U.S. Cl. 35—10.4 **8 Claims**

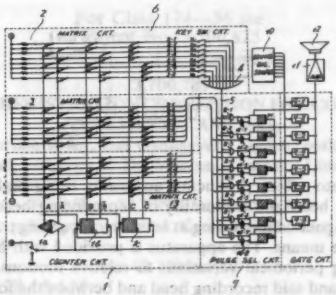


A dual delayed sequence digital generator having a plurality of shift register modules connected to generate linear sequences, each module stage having an output to a solid state switch under the control of a read only memory (ROM) circuit to switch the shift register outputs to a combination of OR gates operating in a modulo-2 manner to sift all shift register outputs to a single digital output through a filter, limiter and buffer, the combination of similar circuits providing a plurality of delayed signals simulating a sonar signal wavefront from a simulated target in inner space.

3,700,781
ELECTRONIC MUSICAL INSTRUMENT

Nobuharu Obayashi, Shizuoka, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Shizuoka-ken, Japan

Filed Jan. 3, 1972, Ser. No. 215,055
Int. Cl. G10h 1/00
U.S. Cl. 84—1.01 **6 Claims**

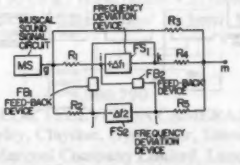


Circuit for an electronic musical instrument in which a matrix coupled to a counter is connected through key switches to an OR gate and thence via a common line to a plurality of gate controlled flip flops also controlled by a second matrix which is coupled to the counter. The flip flops control gates which selectively pass audio signals to a speaker; a third matrix resets the flip flops.

3,700,782
ELECTRONIC TREMOLO EFFECT PRODUCING DEVICE

Yasuji Uchiyama, Shizuoka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-ken, Japan

Filed Jan. 25, 1971, Ser. No. 109,440
Claims priority, application Japan, Jan. 26, 1970, 45/6274; Jan. 26, 1970, 45/7206
Int. Cl. G10h 1/02
U.S. Cl. 84—1.24 **1 Claim**



An electronic tremolo effect producing device in which a musical sound signal frequency is deviated by as much as frequencies of two signals having different frequencies each sufficiently lower than that of said musical sound signal by means of two frequency deviation devices. Respectively a part of the output signal of each frequency deviation device mentioned above is fed back to an input side of its own frequency deviation device or the other frequency deviation device

thereby to obtain a multiple spectrum signal and this signal is mixed with an original musical sound signal thereby to produce a tremolo effect sound.

3,700,783

VIBRATO EFFECT PRODUCING APPARATUS USING A PLURALITY OF REPRODUCING HEADS WHICH ARE INDIVIDUALLY RECIPROCALLY DISPLACED RELATIVE TO EACH OTHER

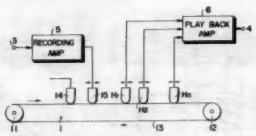
Norio Tomisawa, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-ken, Japan

Filed Nov. 4, 1970, Ser. No. 86,823

Claims priority, application Japan, Nov. 8, 1969, 44/106291; Nov. 8, 1969, 44/106292; Nov. 8, 1969, 44/106293; Nov. 8, 1969, 44/106294; Dec. 19, 1969, 44/120913; Jan. 29, 1970, 45/9093; Jan. 29, 1970, 45/9094; Jan. 29, 1970, 45/9095

Int. Cl. G10h *1/04*; G11b *21/02*

U.S. Cl. 84—1.25 **10 Claims**



A vibrato effect producing apparatus using at least one recording head and a plurality of reproducing heads and at least a magnetic tape having at least one recording track and a tape drive means. The apparatus is provided with means for producing periodical variations to relative motions between said tape and said recording head and between the former and the reproducing heads whereby various frequency modulated tone signals may be derived at the respective reproducing heads simultaneously. These tone signals imparted with different frequency modulations are mixed to provide music sounds having rich frequency spectra.

3,700,784

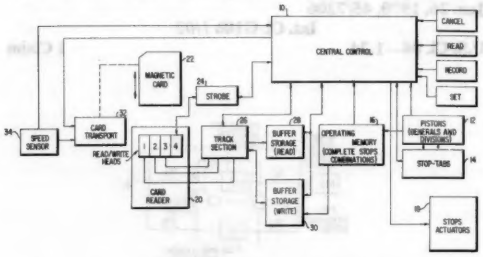
CAPTURE COMBINATION SYSTEM

Laszlo A. Molnar, Tustin, Calif., assignor to North American Rockwell Corporation, Anaheim, Calif.

Filed Oct. 9, 1970, Ser. No. 79,612

Int. Cl. G10b *3/10*

U.S. Cl. 84—345 **30 Claims**



A capture combination system for use in an electronic organ provides rapid reprogramming of the entire combination memory while permitting manual selection of desired stop combinations at any time. Desired stop combinations are selected for each piston and set into the working memory of the system. These combinations, upon command, are transferred from the working memory to a storage or external memory. A full combination of stop settings may be stored on the external memory by transfer from the internal memory, and a number of such external memories corresponding to a number of different full combinations of stop settings thus may be prepared and, subsequently, selectively presented to the system as desired. The combination settings from the external memory are transferred upon command into the internal working memory for establishing the desired combination of stop settings therein. Transfer into or out of the external memory requires but a few seconds. Whenever desired, the working memory may be altered to modify one or more stop combinations, whether set manually, or entered therein from the external memory and, in the latter case, while retaining the combinations recorded in the external memory.

3,700,785

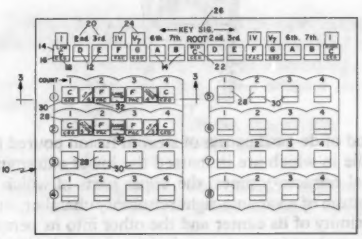
MEANS FOR SIMPLIFIED REWRITING OF MUSIC

Verna M. Leonard, 6353 North Blackstone, Fresno, Calif.

Filed July 2, 1971, Ser. No. 159,134

Int. Cl. G09b *15/00*

U.S. Cl. 84—470 **2 Claims**



The combination of a specially developed work sheet and sticker elements to guide original composition as well as rewriting of music in simplified form without resort to staff paper, a principal feature being means for simply and unmistakably indicating the raising or lowering in the pitch of the next succeeding note and/or chord, a relationship found by music instructors to be not immediately obvious to students, and the pattern of such succeeding relationships, necessary to achieve a desired feeling, mood, or impression in an original composition being found to be quickly and easily recognizable by even somewhat more advanced musicians when recorded according to the present invention. The work sheet carries a representation of a root tone and the notes of the corresponding scale and principal chords in an octave above and an octave below the same, marked writing areas with spaces therebetween, and pre-marked stickers are selectively adhered in the spaces so that the pitch relationships can be recognized at a glance.

3,700,786

MULTI-CONDUCTOR ELECTRIC CABLES

Thomas Lawrenson, Helsby, via Warrington, England, assignor to British Insulated Callender's Cables Limited, London, England

Filed Feb. 29, 1972, Ser. No. 230,325

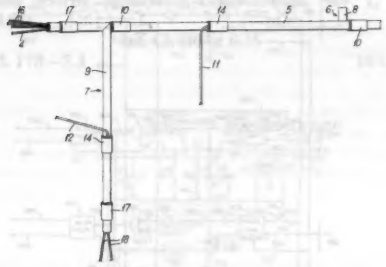
Claims priority, application Great Britain, March 3, 1971, 5,905/71

Int. Cl. H01b *7/08*

U.S. Cl. 174—72 A **30 Claims**

A multi-conductor cable for forming a cable harness, for instance for use in automobiles or aircraft, comprises at least one length of tape cable enclosed in a heat-shrunk tubular sheath of insulating material. At least one branch length of tape cable is electrically connected to the length of tape cable, or to at least one of the lengths of tape cable, at at least one of a number of longitudinally spaced locations, the free end of the branch length protruding from the tubular sheath. An individually insulated conductor and/or a twin or multi-conductor insulated cable may also be enclosed within the tubular

sheath. In a cable harness incorporating the multi-conductor cable at least some of the conductors of the length or lengths



of tape cable and/or of the branch length or lengths of tape cable are electrically connected to insulated terminal leads.

3,700,787

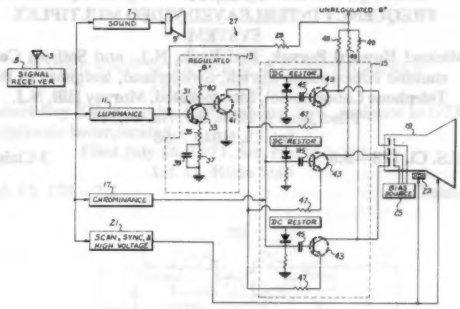
LINE VOLTAGE COMPENSATING CIRCUITRY FOR RGB COLOR DRIVE SYSTEM

Rangaswamy Arumugham, Oakfield, N.Y., assignor to GTE Sylvania Incorporated

Filed Jan. 7, 1971, Ser. No. 104,601

Int. Cl. H04n *9/20*

U.S. Cl. 178—5.4 R **7 Claims**



A color television receiver employing an RGB color drive system wherein a plurality of color amplifier stages are each coupled to a color cathode ray tube electrode, to a source of video signals, to a source of color difference signals, and to an unregulated potential source. Feedback circuitry couples the unregulated potential source to the video signal whereby variations in the unregulated potential source, due to line voltage changes, applied to the color cathode ray tube electrodes are also applied to the video signal source to effect variations in the DC gain thereof providing compensation for the potential source variations applied to the color cathode ray tube electrodes.

3,700,788

ELECTRICAL COMPONENT PACKAGE

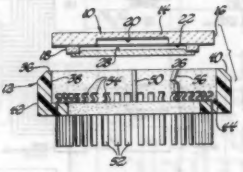
Richard F. Spurck, Golden, Colo., assignor to Coars Porcelain Company, Golden, Colo.

Filed Jan. 28, 1971, Ser. No. 110,693

Int. Cl. H05k *5/00*

U.S. Cl. 174—52 S **12 Claims**

A package for electrical components comprising a carrier for encapsulating the component and a socket for receiving the carrier. The carrier is in the form of a leadless circular flat-pack. The socket is an annular receptacle dimensioned for accepting the carrier therein and includes a plurality of electrical



connectors which engage deposited conductive patterns on the flatpack carrier to complete electrical circuit connections.

ERRATUM

For Class 174—36 see:
Patent No. 3,700,825

3,700,789

MISREGISTRATION CORRECTION FOR COLOR TELEVISION CAMERAS

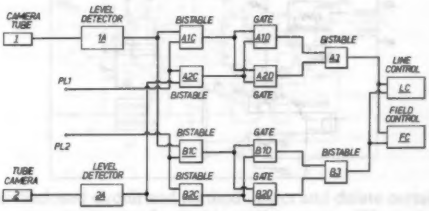
Derek Vernon Ryley, and Gyongyver Claydon, both of Essex, England, assignors to The Marconi Company Limited, London, England

Filed Sept. 23, 1970, Ser. No. 74,739

Claims priority, application Great Britain, Oct. 1, 1969, 48,168/69

Int. Cl. H04n *9/00*

U.S. Cl. 178—5.4 M **7 Claims**



A color television equipment has a plurality of component camera tubes and means for bringing the rasters of the tubes into registration one with another. The time interval between signals produced from each of a pair of tubes when that tube scans an oblique boundary on a test card is used to provide a correction signal to effect registration. Correction signals are derived to correct misregistration in both line and field directions.

3,700,790

COLOR TELEVISION CAMERAS

Derek Vernon Ryley, Claydon, Gyongyver, Essex, England, assignor to The Marconi Company Limited, London, England

Filed July 23, 1970, Ser. No. 57,707

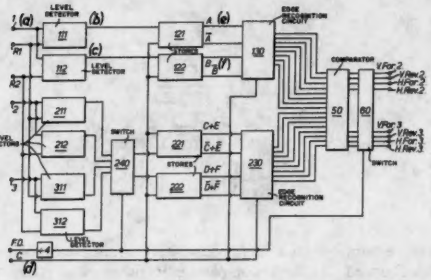
Claims priority, application Great Britain, July 29, 1969, 37,994/69

Int. Cl. H04 *9/08*

U.S. Cl. 178—5.4 M **16 Claims**

A system for correcting misregistration errors in color television camera compares indirectly one with another, the video signals derived from the different camera tubes. Certain variations in the video signals which satisfy predetermined conditions are used to produce further signals by means of

which the comparisons are made, and which if a result of the comparison a misregistration situation is detected which



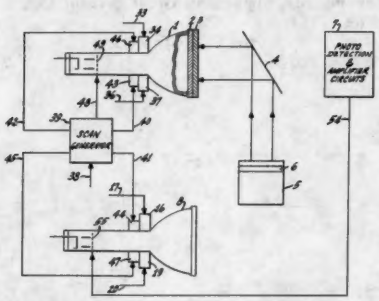
satisfied further predetermined conditions an error correction signal is provided.

3,700,791

CHARACTER GENERATOR UTILIZING A DISPLAY WITH PHOTOCHROMIC LAYER

Douglas Robert Bosomworth, Hightstown, N.J., assignor to RCA Corporation

Filed Oct. 15, 1969, Ser. No. 866,489
Int. Cl. H04n 7/18 ; G02f 1/36
U.S. Cl. 178—6.8 **9 Claims**



A photochromic cathode ray storage tube and means for optically projecting onto the photochromic screen of said tube any one of a number of different fonts. Any character in the font subsequently may be read out and displayed by scanning the electron beam of the storage tube over the portion of the screen storing the character, sensing the light produced during the scanning, and intensity modulating the screen of a display means, such as a concurrently scanned display kinescope, in response to the light which is sensed. The location and size of the area of the display means at which the character is to be displayed may readily be controlled. The font may easily be changed by erasing the one stored and then optically projecting a new font onto the same photochromic screen.

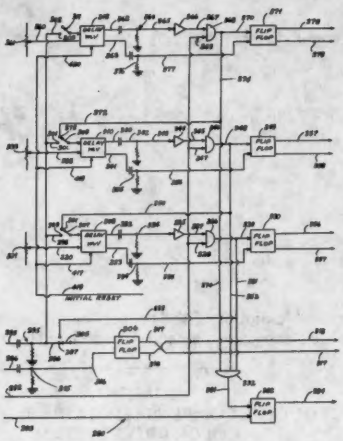
3,700,792

COMPUTER ANIMATION GENERATING SYSTEM

Lee Harrison, III, Englewood; Francis J. Honey, and Edwin J. Tajchman, both of Denver, all of Colo., assignors to Computer Image Corporation, Denver, Colo.

Filed Dec. 4, 1969, Ser. No. 882,125
Int. Cl. H04n 3/30
U.S. Cl. 178—6.8 **29 Claims**

A system for automatically animating scenes viewed by a video camera and displaying the animated scenes. Animation can be collectively of the entire scene or separately of individual sections of the scene viewed by the video camera. Real time animation is selected from any of several pre-programmed animation sequences synchronized with the video camera.

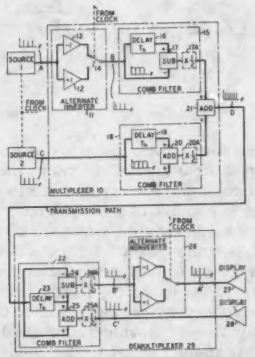


3,700,793

FREQUENCY INTERLEAVED VIDEO MULTIPLEX SYSTEM

Michael Howard Borsuk, Red Bank, N.J., and Sotirios Constantine Kitsopoulos, Zurich, Switzerland, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 9, 1970, Ser. No. 44,711
Int. Cl. H04n 7/08
U.S. Cl. 178—6.8 **3 Claims**



Two video signals having substantially all their energy distributed at the same discrete line harmonics are interleaved to form a multiplexed output. One signal is processed to form a modified signal whose alternate lines are phase inverted so that its energy spectrum is displaced by one-half line frequency from the original harmonics. The modified signal and the other unprocessed signal are algebraically added to produce the multiplexed output. After transmission, the signals are separated by comb characteristic filters and inverse processing reconstructs the original signal.

3,700,794

IMPROVEMENTS IN OR RELATING TO TELEVISION CAMERA CLAMPING ARRANGEMENTS

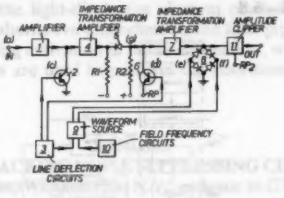
Peter William Loose, Essex, England, assignor to The Marconi Company Limited, London, England

Filed Sept. 28, 1970, Ser. No. 76,170

Claims priority, application Great Britain, Nov. 1, 1969, 53,661/69

Int. Cl. H04n 5/16

U.S. Cl. 178—7.1 10 Claims



A video signal level clamping arrangement for a television camera in which input video signals are clamped to a fixed potential once during each line flyback. The clamped video signals are fed to a signal path into which signals are gated, each of the signals extending for at least the duration of one line flyback period. The resultant spurious free waveform is clamped to a further fixed potential source which is controlled such that it does not clamp during line flyback or outside field suppression. The waveform resulting from the last mentioned clamping is amplitude clipped to produce a stabilized D.C. level corresponding to a predetermined shade, e.g., black.

3,700,795

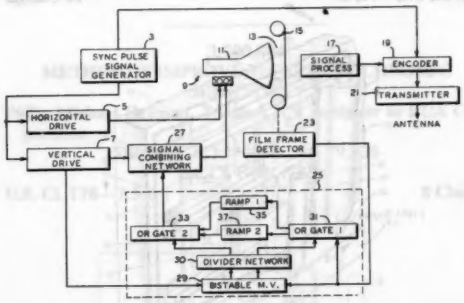
FLYING SPOT SCANNER FOR CONTINUOUSLY ADVANCED FILM

Robert Roy Eckenbrecht, East Bethany, N.Y., assignor to GTE Sylvania Incorporated

Filed July 16, 1971, Ser. No. 163,253

Int. Cl. H04n 5/36

U.S. Cl. 178—7.2 8 Claims



A system for providing a composite color television signal derived from a continuously advancing film of film frames in a flying spot scanner system includes a sync pulse signal generator, encoder, transmitter, horizontal and vertical scan circuitry, film frame detector, and a vertical scan modification signal development means wherein dual ramp signals in analog form are developed and selectively switched in accordance with the positional location of a film frame within a film scanning zone to effect modulation of vertical scanning of the film in accordance with the continuous advancement of the film through the film scanning zone.

3,700,796

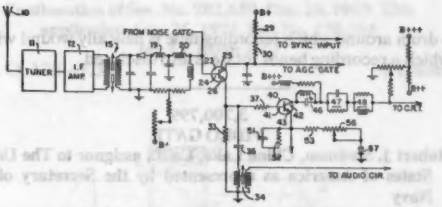
D-C COUPLED SYNC CLIPPING VIDEO AMPLIFIER

Donald E. Griffey, Skokie, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 696,163, Jan. 8, 1968, abandoned. This application July 17, 1970, Ser. No. 56,247

Int. Cl. H04r 5/20; H04n 5/48

U.S. Cl. 178—7.3 R 6 Claims



A diode in series with the emitter of the video output transistor prevents conduction of the transistor during all or the greater portion of the synch pulse. This permits a greater swing of the video information signal coupled to the cathode ray tube of a television receiver.

3,700,797

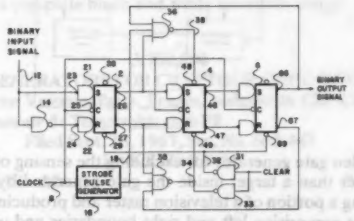
FACSIMILE NOISE DELETION AND CODING SYSTEM

Robert E. Wernikoff, Belmont, Mass., assignor to Electronic Image Systems Corporation, Cambridge, Mass.

Filed Dec. 31, 1969, Ser. No. 889,526

Int. Cl. H04n 7/12

U.S. Cl. 178—6 14 Claims



The disclosed circuit and method detect and delete certain pulse sequence patterns from a binary data stream. When used in a facsimile system to eliminate single pulses from a binary data stream derived by scanning graphic information on a document, the resolution of the scanning system and the size of the graphic information areas being such that two or more pulses in the binary data stream are required to represent the minimum normal elemental area of graphic information, the invention both reduces appreciably the number of pulse sequences required to be communicated and also helps to eliminate isolated noise marks from the facsimile copy.

3,700,798

METHOD OF RECORDING AND/OR REPRODUCING VIDEO SIGNALS

Robert Nestor Joseph Sluys; Johannes Hendrik Wessels, and Willem Van Den Bussche, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 30, 1965, Ser. No. 468,326

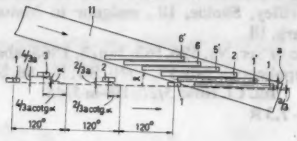
Claims priority, application Netherlands, July 4, 1964, 6407633

Int. Cl. G11b 5/52; H04n 5/78, 7/12

U.S. Cl. 178—6.6 SF 4 Claims

A method of recording and reproducing video signals by recording KN fields of every kn^2 fields of the video signal, and

by scanning each recorded field *n* times. Apparatus including

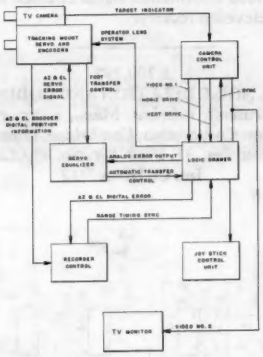


a drum around which recording tape is helically wound within which *n* recording heads rotate is also disclosed.

3,700,799
VIDEO GATE

Robert J. Stedman, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 3, 1970, Ser. No. 25,477
Int. Cl. H04n *7/02*
U.S. Cl. 178—6 **6 Claims**

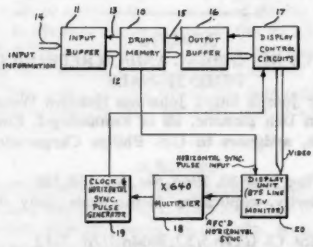


A video gate generator for excluding the sensing of any target other than a target inside the gate generated by digitally sampling a portion of a television raster and producing an output gate comprising left and right boundaries and upper and lower boundaries for superposition on a TV monitor.

3,700,800
DRUM-DISPLAY SYNCHRONIZER

Frederic C. de Learie, Manlius, N.Y., assignor to The United States of America as represented by the Secretary of the United States Air Force

Filed May 18, 1971, Ser. No. 144,477
Int. Cl. G11b *31/00*; H04n *5/04, 5/78*
U.S. Cl. 178—6.6 DD **2 Claims**

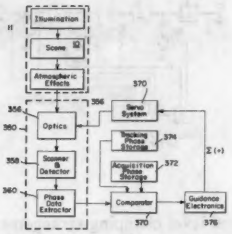


An apparatus for the synchronization of a drum memory to a display unit utilizing a AFC'd horizontal sync pulse from a television monitor. The start of the horizontal sweep and the video signal are both synchronized to the horizontal sync pulse which is derived from clock pulses on the drum surface.

3,700,801
IMAGE ANALYSIS AND CORRELATION SYSTEM AND METHOD

Charles B. Dougherty, Northridge, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Oct. 3, 1966, Ser. No. 583,866
Int. Cl. H04n *7/00*
U.S. Cl. 178—6.8 **19 Claims**

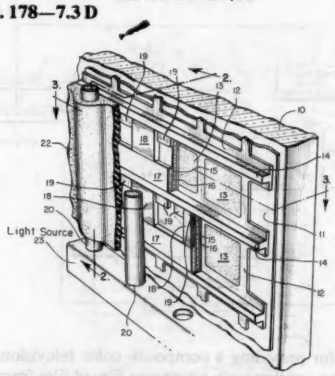


This invention described improved correlation techniques between images by reducing the optical images into electrical signals. Unreliable techniques eliminate variations due to perspective sun angle and optical distortion by using improved techniques for relating the data received from different sources. An improved system and method is described for the analysis of a reference image to an optically-sensed image which performs a Fourier analyses on the electrical signals representing an image. Spatial frequency component amplitudes and/or phases comprising the Fourier frequency components are isolated and quantified for use in a computer.

3,700,802
MATRIX-TYPE IMAGE DISPLAY WITH LIGHT-GUIDE ADDRESSING SYSTEM

Joseph Markin, and Alan Sobel, both of Evanston, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 21, 1970, Ser. No. 100,240
Int. Cl. H04n *9/12*
U.S. Cl. 178—7.3 D **10 Claims**



An image-display panel includes a plurality of light-displaying elements, such as electroluminescent capacitors or liquid crystals, disposed in an array of rows and columns. Associated with each light-displaying element is a photoconductor or other light-responsive device for activating the light-displaying elements. A pair of crossed arrays of fiber-optic light pipes have their crossings in juxtaposition with the photosensitive devices, the light pipes including localized light-emitting aper-

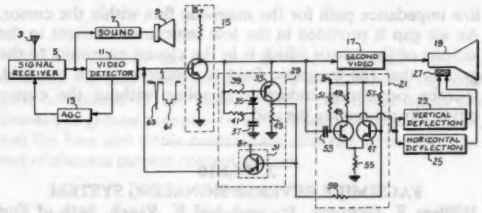
tures near the crossings. A system is included for injecting light into the light pipes in a manner to provide systematic sequential scanning of the photosensitive devices by concurrent light emission from the localized apertures of selected light-conductive elements of both of the arrays. Light emitted from a single light-pipe aperture reduces the resistance of part of the associated photoconductor, but the resistance of the remaining part is sufficient to prevent the light-displaying element from functioning. When light is emitted from both light-pipe apertures associated with the photoconductor at a single display element, the photoconductor resistance is sufficiently reduced that the light-displaying element produces a useful output. In an alternative embodiment, the light pipes are utilized for scanning activation in but one direction, while electrical conductors are used to perform the coordinate scanning function.

3,700,803

SELF-TRACKING NOISE SUPPRESSING CIRCUIT

Dong Woo Rhee, Williamsville, N.Y., assignor to GTE Sylvania Incorporated

Filed March 15, 1971, Ser. No. 124,341
Int. Cl. H04n *5/44*
U.S. Cl. 178—7.3 R **12 Claims**



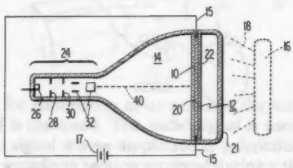
Video signals which may include noise signals are applied via peak signal detecting and signal averaging circuitry to an electron device to effect signal clamping at a given level which varies in accordance with variations in magnitude of the applied video signal and wherein noise signals above the given clamping level are fed back in inverse polarity relationship to cause cancellation of the noise signals in the applied video signal.

3,700,804

METHOD OF IMPROVING CATHODOCHROMIC SENSITIVITY

Philip Michael Heyman, Trenton, N.J., assignor to RCA Corporation

Filed Oct. 8, 1970, Ser. No. 79,036
Int. Cl. G02f *1/28*
U.S. Cl. 178—7.5 D **8 Claims**



Method of operating a display tube comprising a screen including a cathodochromic material. The method comprises steps of heating the cathodochromic material to a temperature below the total erase temperature and writing information on the cathodochromic material (by electron impingement thereon) while the heating is continued.

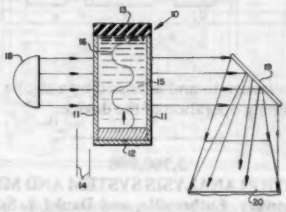
Heating can be done by the writing electron beam and/or supplemental heating means.

3,700,805

BLACK-AND-WHITE IMAGE CONTROL BY ULTRASONIC MODULATION OF NEMATIC LIQUID CRYSTALS

Thomas F. Hanlon, 337 Tremont Avenue, Fort Lee, N.J.

Continuation of Ser. No. 782,659, Dec. 10, 1969. This application Aug. 26, 1971, Ser. No. 175,395
Int. Cl. H04n *3/02*
U.S. Cl. 178—7.3 D **9 Claims**



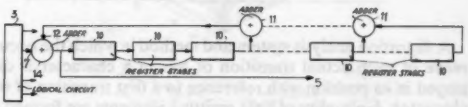
A modulator in which ultrasonic waves are generated by a video carrier potential applied to a piezoelectric transducer mounted in a glass-sided cell containing a nematic liquid crystal, is positioned in the path of light from a source consisting of a stroboscopically pulsed (at the rate of the speed of sound) visible light laser or non-coherent light source, to produce a complete black-and-white television image.

3,700,806

KEY GENERATORS FOR CRYPTOGRAPHIC DEVICES

Jean-Pierre Vasseur, Paris, France, assignor to CSF-Compagnie Generale de Telegraphie sans Fil

Filed Sept. 18, 1967, Ser. No. 668,447
Int. Cl. H04l *9/04*
U.S. Cl. 178—22 **5 Claims**



In a digital key generator, comprising a network of counters triggered by a clock, and feeding a logical circuit having a plurality of outputs supplying the digits of a quasi-random member, at least some of those outputs respectively feed corresponding shift-register converters whose outputs are substituted for the corresponding outputs of the logical circuit, in order to improve the quasi-random nature of the number delivered by the logical circuit.

3,700,807

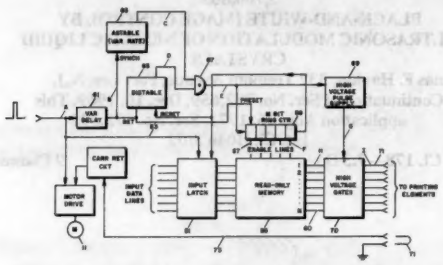
IMPACTLESS PRINTER

Raoul E. Drapeau, Vienna, Va., assignor to Scope Incorporated, Reston, Va.

Filed Feb. 13, 1970, Ser. No. 11,147
Int. Cl. H04l *15/24, 15/34, 17/16*
U.S. Cl. 178—30 **5 Claims**

An impactless printer and control having movable heads with stylii extending therefrom for marking a coated paper. A stepping motor is used to transmit motion to the head so that

the printer is asynchronous. Gating means control the output of a memory device connected to input data lines. The gating means are responsive to and actuated by a strobe pulse which controls the timing operation of the device.

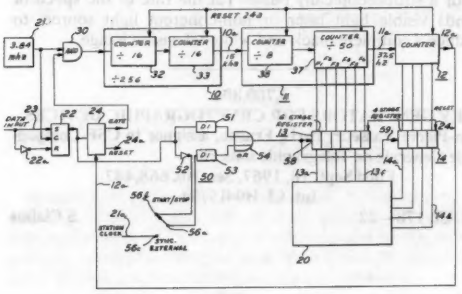


3,700,808

DISTORTION ANALYSIS SYSTEM AND METHOD

Ronald M. Lowery, Lutherville, and Daniel J. Summers, Jr., Kingsville, both of Md., assignors to Computest Corporation, Cherry Hill, N.J.

Filed Oct. 7, 1971, Ser. No. 187,320
Int. Cl. H04l *25/02*
U.S. Cl. 178—69 A **23 Claims**



A distortion analysis system and method in which the occurrence of each actual transition of bits in a character is displayed in its position with reference to a first transition of the character. A plurality of light emitting elements are formed in an array of columns and mapped rows. At the time of the first transition, a first count is made to a predetermined value and then continuously repeated with each count being associated with a different one of the columns. Each time the first count reaches the predetermined value, a second count counts up one with the second count being associated with a different one of the mapped rows. The first and second count which have accrued at the time of each transition are detected and an element is lit which is in both a column associated with the accrued first count and the mapped row associated with the second count.

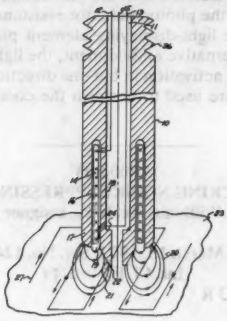
3,700,809

INDUCTIVELY COUPLED GRID CURSOR

Donald J. Nadon, 31449 Fairfax, Livonia, Mich.

Filed Aug. 31, 1971, Ser. No. 176,453
Int. Cl. H04l *21/02*
U.S. Cl. 178—87 **14 Claims**

A cursor for taking position signals from a grid is includes a coil through which inductive coupling with the grid is established. Because inductive coupling is employed, there need be no physical contact between the cursor and the grid. The cursor is configured so that the effects of orientation changes of the sensor parallel to the plane of the grid are eliminated and the effects of orientation changes normal to the plane of the grid are minimized. Furthermore, the cursor includes a low reluctance magnetic element which provides a low impedance path for the magnetic flux within the cursor. An air gap is provided in the low reluctance element in the vicinity of the cursor which is in the closest proximity to the grid so that the magnetic field is concentrated at the grid, thereby permitting inductive coupling without the cursor physically contacting the grid.

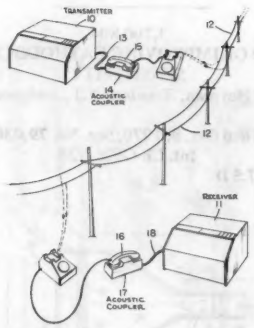


3,700,810

FACSIMILE REVERSE SIGNALING SYSTEM

William E. Richeson, Jr., and Joel K. Roach, both of Fort Wayne, Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed March 26, 1970, Ser. No. 22,930
Int. Cl. H04m *11/06*
U.S. Cl. 179—4 **8 Claims**



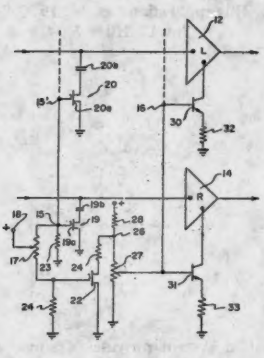
A facsimile transmission system utilizing telephone lines for its communication link is disclosed which is adapted to provide signals from the receiving unit to the transmitting unit to indicate failures of transmission to the transmitter. Provision is also made to simultaneously disable the echo suppressors present in long communication links so that two way communication is possible and to indicate to the transmitter that the receiver is ready to begin operation.

3,700,811

TONE AND VOLUME CONTROL FOR A MULTI-CHANNEL AUDIO AMPLIFIER SYSTEM

John R. Davidson, Rolling Meadows, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed July 20, 1970, Ser. No. 56,312
Int. Cl. H03j 5/04
U.S. Cl. 179—1 D 4 Claims



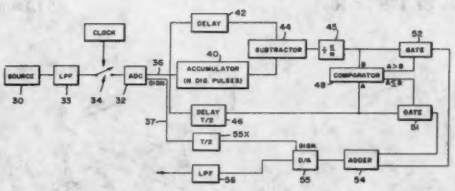
A tone control circuit for an audio amplifier system whereby the bass tones are enhanced by increasing the total gain or volume of the audio system, the treble tones are shunted to ground potential by a variable impedance network, and the bass and treble controls are effected by the DC control of discrete current control devices.

3,700,812

AUDIO SYSTEM WITH MEANS FOR REDUCING NOISE EFFECTS

James C. Springett, La Canada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed March 11, 1971, Ser. No. 123,253
Int. Cl. H04b 15/00
U.S. Cl. 179—1 P 17 Claims



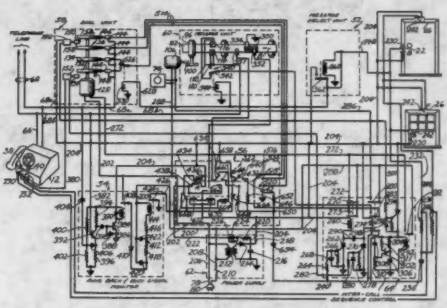
A system for eliminating noise pulses in the waveform of an audio signal is disclosed. The audio signal is used to produce an envelope signal whose amplitude is a function of the amplitude of a waveform section received during a time period T. The amplitude of the center segment of the waveform section is compared with the envelope signal amplitude. If the former is greater than the envelope signal amplitude it represents a noise pulse, and it is substituted by a pulse whose amplitude is either the envelope signal amplitude or the amplitude of a waveform segment adjacent to the noise representing segment.

3,700,813

TELEPHONING SYSTEM

Robert Colman, New York, N.Y., assignor to General Alarm Corporation, New York, N.Y.

Division of Ser. No. 587,589, Oct. 18, 1966, Pat. No. 3,519,745. This application Dec. 4, 1969, Ser. No. 879,963
Int. Cl. H04m 11/04
U.S. Cl. 179—5 P 30 Claims



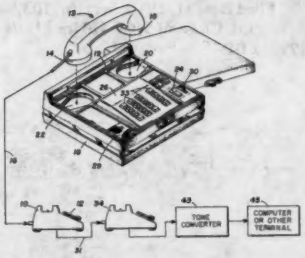
Automatic telephoning systems which include means for generating signals in response to the occurrence of ringback and busy signals following a dialing operation and means for controlling the operation of a message broadcast unit and of a call sequence unit in response to the generated signals.

3,700,814

PORTABLE INPUT-OUTPUT TERMINAL

Earl D. Spraker, Dallas, Tex., assignor to Electronic Data Systems Corporation, Dallas, Tex.

Division of Ser. No. 773,680, Sept. 16, 1968, abandoned. This application April 16, 1969, Ser. No. 842,747
Int. Cl. H04m 11/00
U.S. Cl. 179—2 10 Claims



A pushbutton tone generator having a housing to receive the handpiece of conventional, dial-type telephones for converting same by means of audio-coupling to a tone transmitting station with automatic call and identification means and selectable data encoding means.

3,700,815

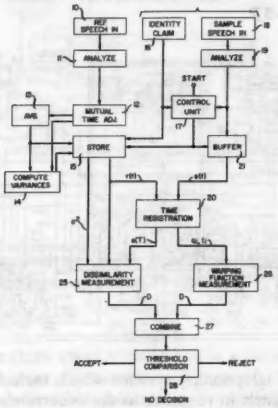
AUTOMATIC SPEAKER VERIFICATION BY NON-LINEAR TIME ALIGNMENT OF ACOUSTIC PARAMETERS

George Rowland Doddington, Richardson, Tex.; James Loton Flanagan, Somerset, and Robert Carl Lummis, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed April 20, 1971, Ser. No. 135,697
Int. Cl. G10l 1/02
U.S. Cl. 179—1 SA 12 Claims

Speaker verification, as opposed to speaker identification, is carried out by matching a sample of a person's speech with a

reference version of the same text derived from prerecorded samples of the same speaker. Acceptance or rejection of the person as the claimed individual is based on the concordance of a number of acoustic parameters, for example, formant frequencies, pitch period and speech energy. The degree of match is assessed by time aligning the sample and reference



utterance. Time alignment is achieved by a nonlinear process which maximizes the similarity between the sample and reference through a piece-wise linear continuous transformation of the time scale. The extent of time transformation that is required to achieve maximum similarity also influences the decision to accept or reject the identity claim.

3,700,816

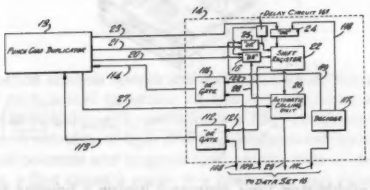
TELEMETERING REMOTE RECORDING UNIT

Ross Hugh Evans, Queens Village, N.Y.; Daniel Arron Seltzer, Cincinnati, Ohio, and Robert Leonard Young, Florence, Ky., assignors to Gamon-Calmet Industries, Inc., Florence, Ky.

Filed Dec. 31, 1970, Ser. No. 103,067

Int. Cl. G06f *3/00*; H04m *11/00*

U.S. Cl. 179—2 DP **9 Claims**



A system is disclosed for reading utility meters over a switched telephone network. In the system, information, including a telephone number is stored on a first punch card and reproduced by a card duplicator on a second initially blank punch card. The information representing the telephone number in addition to being reproduced on the second card, is also entered into a storage register. The number in the storage register is called up by an automatic calling unit and pulsed out onto a switched telephone network. The switched telephone network activates a meter reading circuit at an appropriate location represented by the telephone number. The meter reading circuit generates signals indicative of the meter reading and sends them back over the switched telephone network to be stored in the same storage register where the telephone number was entered When the complete meter reading signal is in the storage register, the card duplicator is again activated to now receive information from the storage register. This information is then punched onto a still blank area on the second punch card. Details of the storage register and the circuitry at the meter are also disclosed.

3,700,817

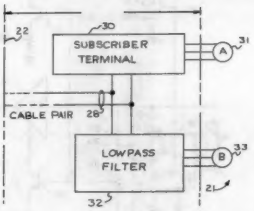
SINGLE CHANNEL CARRIER TELEPHONE SYSTEM

Julian Garcia, and James C. Carroll, both of Raleigh, N.C., assignors to International Telephone and Telegraph Corporation

Continuation-in-part of Ser. No. 700,784, Jan. 26, 1968, abandoned. This application Oct. 16, 1970, Ser. No. 81,506

Int. Cl. H04h *1/04*

U.S. Cl. 179—2.5 R **8 Claims**



The described system provides a single channel carrier system for doubling the capacity of existing subscriber lines and PBX lines. Systems of this type have been made before, but they have generally failed for a number of reasons ranging from their inability to cope with variations in line impedances to microphonics and position sensitivity of telephone transmitters. The invention provides circuits which overcome these and other "bugs."

3,700,818

AUTOMATIC ANSWERING TELEPHONE SET

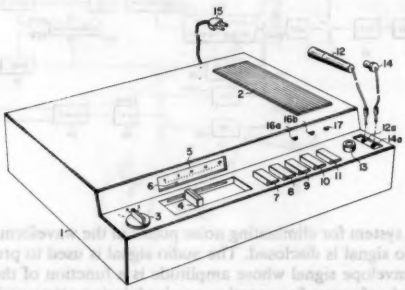
Kenzo Tatematsu, Amagasaki-shi; Hiroo Hosono, Osaka; Toshio Katagiri, Neyagawa-shi; Yoshiaki Hayashi, Toyonaka-shi, and Hiroyuki Ando, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Sept. 14, 1970, Ser. No. 71,876

Claims priority, application Japan, Aug. 4, 1970, 45/68571; Sept. 20, 1969, 44/89787; Sept. 20, 1969, 44/89816; Sept. 20, 1969, 44/90295; Sept. 22, 1969, 44/92588; Nov. 12, 1969, 44/107985; Dec. 29, 1969, 44/358; Aug. 4, 1970, 45/77977; Aug. 12, 1970, 45/80825

Int. Cl. H04m *1/64*

U.S. Cl. 179—6 R **25 Claims**



In an automatic answering telephone set which is arranged to operate after receiving a call through an office line, then to send a preliminarily recorded message on a magnetic tape as an answer to the caller, and after sending, to record a message from the caller with a spiral track on a wide endless magnetic tape, the structure is improved as any one of the messages

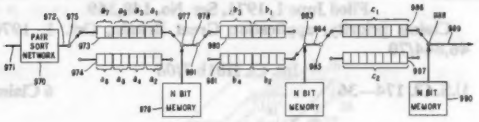
from the callers may be readily selected and reproduced by an operator and other operations are also simplified.

3,700,819

TIME DIVISION SWITCHING SYSTEM WITH TIME SLOT INTERCHANGE

Michael Jay Marcus, Cambridge, Mass., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Dec. 7, 1970, Ser. No. 95,706
Int. Cl. H04j *3/00*
U.S. Cl. 179—15 AQ **21 Claims**



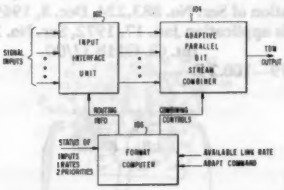
A multistage network for permuting an input sequence of signals is described. Typically, this sequence corresponds to time division multiplexed communication signals. The overall permuting is accomplished by partially permuting the signals at each stage of selectively delaying these signals in accordance with stored control information. Techniques are described for deriving the required control information and a number of alternate embodiments for the delay circuitry are presented.

3,700,820

ADAPTIVE DIGITAL COMMUNICATION SYSTEM

Herman L. Blasbalg, Baltimore; Joshua Y. Hayase, Bethesda; Richard C. Crutchfield, Jr., Potomac, all of Md., and Hann F. Najjar, Annandale, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 542,934, April 15, 1966, Pat. No. 3,534,264. This application March 18, 1969, Ser. No. 870,721
Int. Cl. H04j *3/16*
U.S. Cl. 179—15 BV **4 Claims**



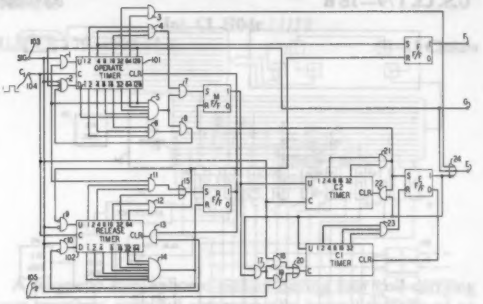
An adaptive digital multiplexer including a multiplex format computer, a time slot generator, and a combiner. The format computer determines the number of time slots required within a time frame and assigns input signals to time slots according to the information rate and priority of each input signal. Assignments are made such that transmission of lower priority input signals are interleaved between transmission of higher priority signals thereby allowing the multiplexed output to be adapted to a reduced transmission rate of increased bit duration by progressively eliminating transmission of lower priority signals.

3,700,821

DIGITAL CONSTANT-PERCENT-BREAK PULSE CORRECTING SIGNAL TIMER

Bruce Russell Savage, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 9, 1970, Ser. No. 87,851
Int. Cl. H04g *1/36*
U.S. Cl. 179—16 E **4 Claims**



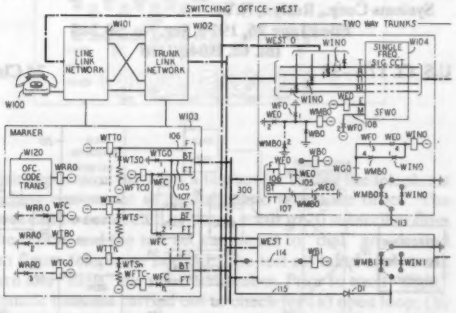
In a constant-percent-break pulse corrector circuit, pulses to be corrected are applied to first and second digital counters, the first of which counts a control clock signal at a first rate set in accordance with the minimum rate of pulses to be corrected. Circuitry including logic means is responsive to the input pulses and to the operation of the first counter for initiating the operation of the second counter, first at the minimum control clock rate and then at a second rate set in accordance with the maximum rate of pulses to be corrected. The transition between rates is determined by the rate of input pulses. Circuitry responsive to the outputs from the counters generates a pulse train with a constant-percent-break ratio irrespective of the rate of the input pulses.

3,700,822

ARRANGEMENT FOR REDUCING GLARE ON TWO-WAY TRUNKS

Walter William Fritschi, Denver, Colo., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed April 30, 1971, Ser. No. 139,011
Int. Cl. H04m *7/00*
U.S. Cl. 179—18 AH **13 Claims**

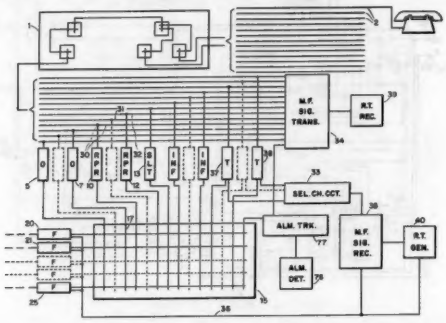


An arrangement is disclosed for minimizing the possibility that two-way interoffice trunks will be seized at both ends, simultaneously, for calls originating at each office. Each time a predetermined number of trunks are seized at either office a busy condition is imposed at the opposite end of at least two other trunks. These trunks become, in effect, temporary one-way trunks.

3,700,823
COMBINED ALARM TRANSMISSION AND SERVICE CALL SYSTEM

William Chulak, Chambly, Quebec, Canada, assignor to Northern Electric Company, Limited, Montreal, Quebec, Canada

Filed Sept. 2, 1971, Ser. No. 177,389
Int. Cl. H04m 3/42
U.S. Cl. 179—18 B 33 Claims

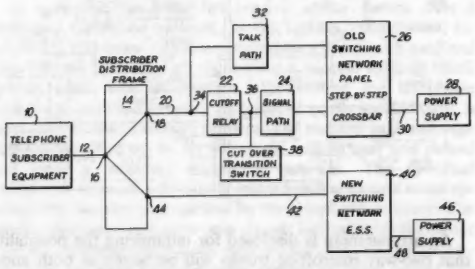


Multifrequency signaling equipment is used to transmit alarm initiation and alarm cancelling signals and also signals for connecting calls over channels selected from a plurality connecting two locations at each of which a large access switch is located. Just after a channel is seized by a connection through one switch a multifrequency signal is sent over the connection and channel to direct the connection at the other switch. Alarm signals bypass the second switch. A reply tone releases the transmitter lockout circuit dropping the multifrequency signaling equipment off the call and allowing it to process another call. Alarm signals are periodically repeated if not acknowledged by reply tone. The system may operate in both directions or a one way system may be used with manual calling in the other direction. An alternative form of systems uses a particular channel for the signaling function and in this case alarm signals do not pass through either of the large access switches. The system is designed particularly for operator assistance, information and repair service calls into a telephone company service center.

3,700,824
CUTOVER TRANSITION SWITCHING APPARATUS AND METHOD FOR TELEPHONE OFFICE EQUIPMENT

Paul V. De Luca, Port Washington, N.Y., assignor to Porta Systems Corp., Roslyn, N.Y.

Filed June 26, 1970, Ser. No. 50,248
Int. Cl. H04q 1/18
U.S. Cl. 179—98 24 Claims

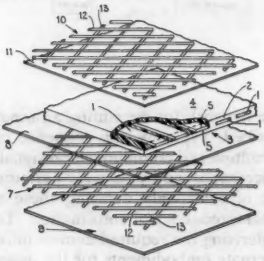


An electrical transition switching apparatus and method for permitting transition switching of subscribers lines from earlier generation switching system units such as, panel, crossbar and step-by-step to similar generation systems or to new generation systems such as, the new electronic switching system units (E.S.S.), comprising cut through relay members, power distribution members and relay actuation means for selectively actuating and deactuating said relay members to thereby permit reversible connection of the subscribers' lines to either of the similar generation units and the new E.S.S. units or to the earlier generation units to which they were originally connected.

3,700,825
CIRCUIT INTERCONNECTING CABLES AND METHODS OF MAKING SUCH CABLES

Stanley Donovan Taplin, Hitchin, and Malcolm Jack Pettitt, Stevenage, both of England, assignors to International Computer Limited, London, England

Filed June 1, 1971, Ser. No. 148,369
Claims priority, application Great Britain, Oct. 1, 1970, 46,844/70
Int. Cl. H01b 7/08
U.S. Cl. 174—36 6 Claims

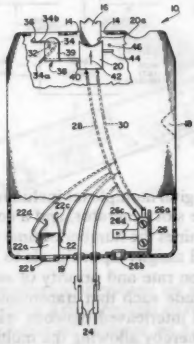


A circuit interconnecting cable construction includes a cable having a group of side-by-side spaced apart conductors embedded in insulating material to provide a cable of tape like form with a surface substantially parallel to the conductors. An electrically conductive screen is located adjacent this surface and a lattice structure is placed between the screen and the surface to space the screen a predetermined distance from the conductors.

3,700,826
MULTI-TRACK ADAPTER CARTRIDGE ADAPTER UNIT FOR A MULTI-TRACK CARTRIDGE TYPE MAGNETIC TAPE PLAYER

Donald V. O'Neal, 2459 Rhodes, River Grove, Ill.

Continuation of Ser. No. 883,224, Dec. 8, 1969, abandoned.
This application Jan. 17, 1972, Ser. No. 218,499
Int. Cl. G11b 31/00
U.S. Cl. 179—100.2 Z 4 Claims



A transducer mounted within a cartridge housing is positioned so as to be urged against the playback head of the tape

player. One or more terminals are provided at the other end of the cartridge housing for easy connection to other signal producing means such as cassette tape recorders, transistor radios, or the like.

3,700,827

MAGNETIC HEAD INCLUDING THIN MAGNETIC FILM SEPARATED BY A GAP SPACER

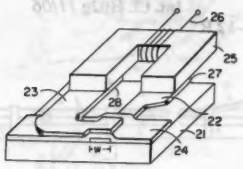
Morimasa Nagao, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Jan. 27, 1971, Ser. No. 110,054

Claims priority, application Japan, Jan. 31, 1970, 45/8658; Jan. 31, 1970, 45/8659

Int. Cl. G11b 5/22

U.S. Cl. 179—100.2 C 4 Claims



A thin film magnetic head includes a substrate on which thin film core portions are formed. The core films overlap at one end and a gap spacer is interposed between the overlying ends of the core portions to form a gap having a width defined by a reduced width end portion of one of the core portions and corresponding to the track width.

3,700,828

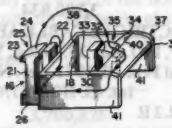
MAGNETIC HEAD ASSEMBLY WITH LOW READ TO WRITE CROSSTALK

Edward C. Zacaroli, Utica, N.Y., assignor to Hamilton Digital Controls, Inc., Utica, N.Y.

Continuation-in-part of Ser. No. 34,138, May 4, 1970, abandoned. This application Oct. 7, 1971, Ser. No. 191,545

Int. Cl. G11b 5/10

U.S. Cl. 179—100.2 C 13 Claims



A low crosstalk read and write magnetic tape recording head assembly includes longitudinally spaced banks of transversely spaced dual gap electromagnetic transducer elements provided with respective windings. A shield formed of a low reluctance, magnetically soft material includes a first panel disposed between and spaced from the transducer banks and offset toward the write transducers, a second panel extending outwardly from the outer front edge of the read transducers with its inner edge spaced closely from the transducer edge, and a pair of transversely spaced parallel panels interconnecting the first and second panels.

3,700,829

MAGNETIC STEREOPHONIC PHONOGRAPH PICKUP

Vilhelm Anneberg, Herlev; Ellen Clemmensen, Birkerod; Robert Gudmandsen, Tastrup, and Axel Schelbel, Kobenhavn NV, all of Denmark, assignors to Fonofilm Industri A/S, Copenhagen, Denmark

Filed Dec. 15, 1969, Ser. No. 885,220

Claims priority, application Denmark, March 25, 1969, 1636/69

Int. Cl. H04r 11/12

U.S. Cl. 179—100.41 K 21 Claims

A magnetic stereophonic pickup having four coil carrying core members arranged symmetrically around the axis of an annular ceramic magnet against the inner pole and end face of which one end of said core members abut the opposite ends being magnetically interconnected. A magnetic armature connected to a stylus is so supported within and coaxial with the magnet that it can oscillate in any direction about a point adjacent the outer end thereof. The armature acts as a variable magnetic load converting stylus movements into variations of the magnetic potentials at the magnet abutting ends of the core members, said potential variations in turn causing flux variations in the coil carrying core members.

3,700,830

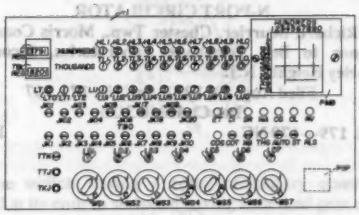
AUTOMATIC CALL THROUGH TEST SET

David C. Naylor, Dollard des Ormeaux, Quebec, and Derek Leyburn, Mississauga, Ontario, both of Canada, assignors to Bell Canada, Montreal, Quebec, Canada

Filed July 7, 1970, Ser. No. 52,792

Int. Cl. H04m 3/22

U.S. Cl. 179—175.2 R 19 Claims

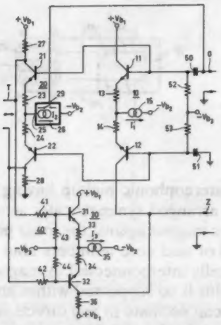


This application discloses a test set for testing the telephone switching equipment at an automatic telephone office. The test set can be connected by patch cords to 20 subscriber lines at the office, and the test set can be set to "dial" any desired seven figure telephone number. The test set takes each trunk in turn and "dials" the selected number. Prior to each "digit," automatic tests are carried out to check for (a) open loop; (b) open sleeve; and (c) reversed loop. At the completion of the dialing operation i.e. the 7th digit, two further tests are carried out (d) no answer, and (e) slow release. If a fault appears at any test, the test set stops and indicates the faulty trunk and the type of fault. If no fault appears, once one trunk is tested the next trunk is seized and tested. Further, after one set of "connectors" is tested, the next set of "connectors" is similarly tested.

3,700,831
HYBRID CIRCUIT

Einar Andreas Aagaard; Johannes Anton Greefkes, and Adrianus Wilhelmus Maria van den Enden, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 8, 1971, Ser. No. 105,023
Claims priority, application Netherlands, Jan. 13, 1970, 7000395
Int. Cl. H03f 3/62; H04b 1/58
U.S. Cl. 179—170 NC 2 Claims

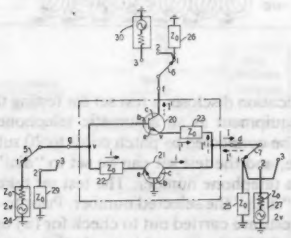


Hybrid circuit for coupling a two-direction transmission path with a one-direction transmitting path and a one-direction receiving path, the arrangement comprising a first amplifier whose input is connected to the receiving path and whose output is connected to the two-direction transmission path, a second amplifier whose input is connected to the two-direction transmission path and whose output is connected to the transmitting path and a third amplifier whose input is connected to the receiving path and whose output is connected to the transmitting path, wherein the second amplifier is a direct-voltage differential amplifier and the first amplifier comprises a balanced direct-voltage-coupled output, while a damping network is connected between the two-direction transmission path and the input of the second amplifier.

3,700,832
N-PORT CIRCULATOR

Henry Richard Beurrier, Chester Twp., Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Aug. 19, 1971, Ser. No. 172,967
Int. Cl. H04b 3/36
U.S. Cl. 179—170 NC 10 Claims

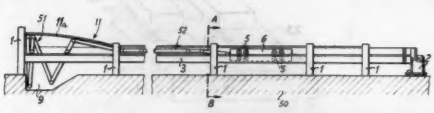


This application describes an *n*-port circulator comprising *n* identical circuit units arranged in a closed loop configuration. Each unit is a three terminal circuit including two transistors and two equal, impedance-matching impedances. The first terminal is connected to the base of the first transistor, and to the emitter of the second transistor through one of the impedances. The second terminal is connected to the collector of the second transistor, and to the emitter of the first transistor through the other impedance. The third terminal is connected to the collector of the first transistor, while the base of the second transistor is grounded. The units are interconnected such that the third terminal of each is coupled to the first terminal of the next adjacent unit in the loop. The second terminals of the units constitute the ports of the circulator.

3,700,833
DEVICE FOR CONVEYING FLUIDS OR ELECTRIC CURRENT BETWEEN A STATIONARY SOURCE AND A MOBILE CONSUMER

Henning Behme, Haan, Germany, assignor to Th. Kieserling & Albrecht Werkzeugmaschinen Iabrik, Solingen, Germany

Filed Dec. 14, 1970, Ser. No. 97,524
Claims priority, application Germany, Dec. 12, 1969, P 19 62 268.5
Int. Cl. H02g 11/06
U.S. Cl. 191—12 R 10 Claims

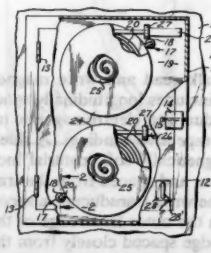


A device for conveying fluids or electric current between a stationary source and a mobile consumer, such as one or more motors on the reciprocable carriage of a drawing machine, has a package of elongated sections wherein the upper end of each intermediate section is pivoted to the upper end of one neighboring section and the lower end of each intermediate section is pivoted to the lower end of the other neighboring section. One end of one outer section is connected to the carriage which is reciprocable toward and away from the source along one or more elongated first guide rails tracked by roller followers provided on alternating sections of the package close to the upper ends of such sections. The upper ends of some or all of the sections carry roller followers which track a second guide rail located above the first guide rails and having a downwardly sloping portion close to the source. When the carriage moves toward the source, successive sections are pivoted in the region of the sloping portion to assume substantially vertical positions close to each other. When the carriage is moved away from the source, successive sections are pivoted to move into a substantially horizontal plane and to form an elongated pipeline extending lengthwise of the first guide rails.

3,700,834
ELECTRICAL CABLE APPARATUS

Cyril L. Schaefer, P.O. Box 33, Potosi, Wis.

Filed Feb. 10, 1971, Ser. No. 114,129
Int. Cl. H02g 11/00
U.S. Cl. 191—12.2 R 1 Claim



A device for attachment to service vehicles. This device consists of a hinged doored case, having on its interior a pair

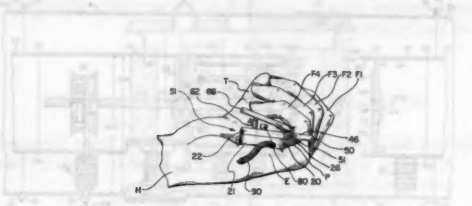
of reels with spring return means for the heavy duty electrical cables thereon. The cables, when extended, allow for the service vehicles battery and electrical system to supply a boosting current for starting stalled vehicles.

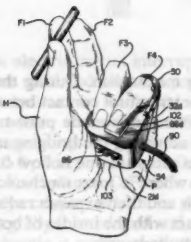
3,700,835

HAND HELD, FINGER CONTROLLED SWITCH DEVICE

Chester B. Rackson, 22 Orchard Drive, Woodbury, N.Y.

Filed April 5, 1971, Ser. No. 131,359
Int. Cl. H01h *3/02, 13/08*
U.S. Cl. 200—52 R **20 Claims**





A control device for apparatus is adapted for support on the fourth finger of a hand, has a housing of contoured shape to fit in the palm of the hand. A loop extends outwardly of one end of the housing for receiving and encircling the base of the fourth finger. Switches on other control units in the housing have operating members extending upwardly of the housing for operation by third and fourth fingers. Operating levers may be pivotally mounted over the operating members. Other clips on one of the levers and a lateral extension of the loop can provide additional stabilization from rotational movement of the control device on the fourth finger. Other operating members can extend laterally outward of the housing. The control device may contain units for actuating electrical, pneumatic or hydraulic apparatus and combinations of the aforementioned types of apparatus.

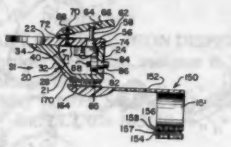
3,700,836

HAND HELD FINGER CONTROLLED SWITCH DEVICE WITH FLEXIBLE WRIST STRAP MOUNT

Chester B. Rackson, 22 Orchard Drive, Woodbury, N.Y.

Filed May 10, 1971, Ser. No. 141,726
Int. Cl. H01h *3/02, 13/08*
U.S. Cl. 200—52 R **20 Claims**

A control device for apparatus is adapted for support on the fourth finger of an operator's hand, has a housing of contoured shape to fit in the palm of the hand. A loop extends outwardly of one end of the housing for receiving and encircling the base of the fourth finger. Switches or other control units in the housing have operating members extending upwardly of the housing for operation by third and fourth fingers. The holder is connected to the housing integrally or separably. The holder may include a wrist band and strap integrally or separably connected together. Barb and loop fastener members may adjustable connect the strap and housing. Loop members to engage the back of the hand can be integral with the strap or with the housing. The holder can have a fingerless glove-like form with integral wrist band, strap and back portion.

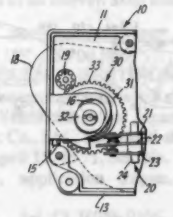


3,700,837

ADJUSTABLE TIMER CAM ASSEMBLY SPRING BIASED BY CONTACTS FOR NORMAL ENGAGEMENT WITH SYNCHRONOUS MOTOR DRIVEN GEAR

Karl J. Schulze-Berge, Manitowoc, Wis., assignor to AMF Incorporated

Filed July 6, 1971, Ser. No. 159,615
Int. Cl. H01h *43/10*
U.S. Cl. 200—38 R **8 Claims**



A time switch having a rotor of unitary construction mounted at its ends in slots and having a meshed gear connection with drive means. Switch means providing a biasing force to said rotor for maintaining the meshed gear connection and said rotor being adapted for manual rotation relative to said drive means and against the biasing force causing its ends to move in said slots and said gears providing the drive connection to move out of mesh.

3,700,838

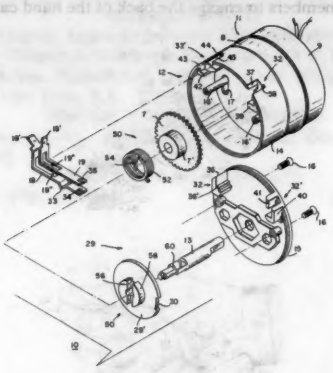
TIMER UTILIZING SPRING CLUTCH

William R. Brown, Beech Grove, and Veron E. Bang, Indianapolis, both of Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed April 23, 1971, Ser. No. 136,773
Int. Cl. H01h *7/08, 43/10*
U.S. Cl. 200—38 R **19 Claims**

A coil spring is frictionally carried by a member of a drive means which drives a cam programming means of a timer, a

distal end of the spring being coupled to a shaft which carries



the cam programming means. Electrical contact blade retaining means are formed as integral parts of the timer housing.

3,700,839

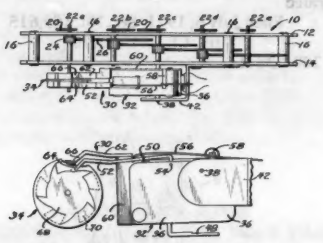
WATTHOUR METER INDICATOR WITH IMPROVED CAM AND MICROSWITCH OPERATOR STRUCTURE

Donald A. Eggleston, Springfield, and Trevor N. Samuel, Rochester, both of Ill., assignors to Sangamo Electric Company, Springfield, Ill.

Filed June 28, 1971, Ser. No. 157,484

Int. Cl. G01d *13/26*

U.S. Cl. 200—56 R **12 Claims**



An arrangement for effecting snap-action transfer of a switch between first and second switch conditions in response to movement of a slowly rotating control cam. The switch has a pair of actuating arms secured thereto one of which is movable to effect snap-action transfer of the switch from a first to a second switch condition in response to movement of the control cam, the other of arms being movable to effect snap-action transfer of the switch from the second back to the first switch condition in response to further movement of the control cam.

3,700,840

ISOLATING SWITCH

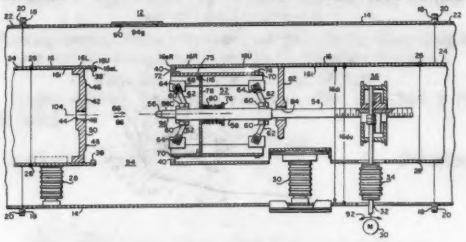
John R. Wilson, Westmont, Ill., and Arthur B. Niemoller, Cincinnati, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 11, 1971, Ser. No. 114,631

Int. Cl. H01h *31/24*

U.S. Cl. 200—48 R **12 Claims**

An isolating switch comprising cylindrical hollow conductors capable of carrying high electrical currents and mounted within gas filled, sealed cylindrical enclosures for insulating purposes. The switch when open provides an insulating gap for withstanding high voltages. The gap is bridged when the switch is closed by a telescoping bridging members. This bridging member retracts inside one of the associated hollow poles or conductors when the switch is opened, and extends to bridge the gap between the two cylindrical poles when the switch is closed thus providing a continuous electrical path from one pole to the other. The contacting member is moved



by a suitable driving mechanism. During the closing of the switch, mechanical or structural contact between the poles or conductors to be connected is made prior to electrical contact. This is done by actuating the bridging member to move axially from within its recess in one hollow conductor toward the other conductor where it joins mechanically with or engages a guiding means and then expands radially outwardly to make electrical contact with the insides of both the associated hollow conductors simultaneously.

3,700,841

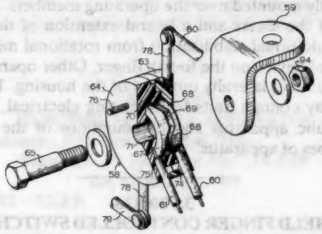
A SWITCH FOR SENSING DISPLACEMENT

James H. Wernig, P.O. Box 501, Kennebunkport, Maine

Division of Ser. No. 869,697, Oct. 27, 1969. This application April 19, 1971, Ser. No. 135,273

Int. Cl. H01h *3/16*

U.S. Cl. 200—61.44 **5 Claims**



A switch for closing an electric circuit upon movement of either or both of two members in either direction which includes a double contact and a contact disposed between the elements of the double contact which are movable to bring the contact and one of the elements of the double contact together upon movement of either or both of the two members in either direction.

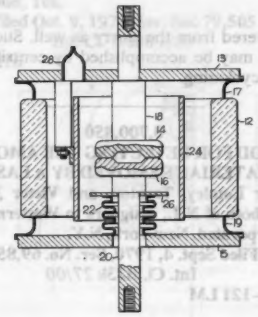
The switch also includes means for varying the clearance between the contact and the elements of the double contact when the former is centered with respect to the latter in order to vary the sensitivity of the switch.

3,700,842

VACUUM INTERRUPTER CONTACTS AND METHOD FOR MAKING THE SAME

Edward A. Attia, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 23, 1971, Ser. No. 201,465
Int. Cl. H01h *1/02*
U.S. Cl. 200—166 C 6 Claims



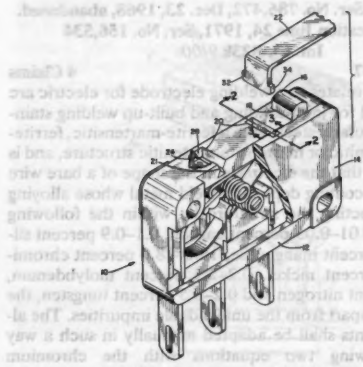
A vacuum type electric circuit interrupter comprises a glass envelope, stainless steel end plates, a pair of relatively movable studs with a contact on each within the envelope, and shielding means within the envelope. Each stud and its associated contact are integrally formed of an alloy comprising by weight 0.4 to 0.6 percent tellurium, 0.007 to 0.012 percent phosphorus and the balance O.F.H.C. copper (oxygen free high conductivity copper which is 99.95 percent pure copper). The integrally formed stud and contact are subjected to a treatment wherein it is: raised slowly to 500°C. and held there for approximately ½ hour; exposed to ultra-pure hydrogen and raised slowly to about 900°C.; exposed to a vacuum and raised to about 975°C. to effect brazing of components thereto; lowered to about 500°C. in the vacuum and held there to cause effusion of certain gases; and cooled in the vacuum prior to final assembly.

3,700,843

SNAP-IN RIGID LEVER ACTUATING ARRANGEMENT

John S. Resh, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 5, 1971, Ser. No. 196,116
Int. Cl. H01h *3/04*
U.S. Cl. 200—172 A 5 Claims



A rigid lever actuator which is snap fastened into place in a support means provided on an electrical switch base, for example, for association with a driver member of a switch mechanism supported from the base.

ERRATUM

For Class 200—148 R see:
Patent No. 3,700,848

3,700,844

QUATERNARY FLUORSILICON DISPERSANT

Elemer Domba, Olympia Fields, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Filed May 7, 1971, Ser. No. 141,420
Int. Cl. C07c *103/30*
U.S. Cl. 260—404.5 2 Claims

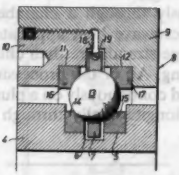
Surface active agents are produced by forming quaternary fluorosilicon compounds by reacting perfluoro-alkyl esters with tertiary diamines.

3,700,845

WIRE RACE BALL BEARING

Karl-Erik Arnold Jonsson, Gavle, Sweden, assignor to Brundell och Johsson AB, Gavle, Sweden

Filed June 22, 1971, Ser. No. 155,543
Claims priority, application Sweden, June 24, 1970, 8737/70
Int. Cl. F16c *33/58*
U.S. Cl. 308—216 2 Claims



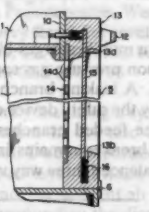
A wire race ball bearing containing two outer and two inner wire race rings, the distance between the inner races being smaller than the distance between the outer races, whereby the axes of rotation of the balls are kept unchanged when the bearing is subjected to an uneven axial load.

3,700,846

HIGH FREQUENCY HEATING APPARATUS

Teruo Ishikawa, Kanagawa-ken; Koji Kawashima, and Tetuo Togashi, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed April 15, 1971, Ser. No. 134,265
Claims priority, application Japan, April 30, 1970, 45/41849
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 5 Claims

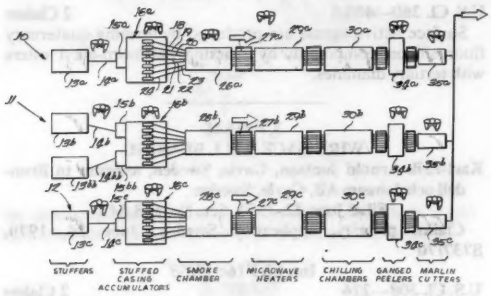


In high frequency heating apparatus, particularly a high frequency electronic oven having a door with a perforated metal plate, a transparent cover plate is removably mounted on the door on the outside of the perforated metal plate and means is provided to operate a switch in the oven for deenergizing the high frequency oscillator in response to the removal of the transparent plate.

3,700,847
SYSTEM FOR CONTINUOUS PROCESSING OF VIENNA SAUSAGE USING MICROWAVE ENERGY

Robert B. Rendek, Hillside, and Evan F. Binkerd, Downers Grove, both of Ill., assignors to Armour & Company, Chicago, Ill.

Filed July 6, 1970, Ser. No. 52,504
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 **8 Claims**

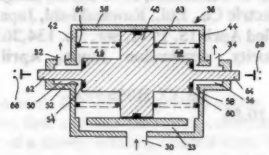


A plurality of casings stuffed with vienna emulsion are conveyed simultaneously through a chamber for smoking and then through a microwave heat applicator which cooks the sausage. The sausage strands are then chilled, peeled and cut to size for packaging. All of the processing from smoking to cutting is performed continuously on a plurality of long stuffed casings conveyed longitudinally through the processing apparatus or stations.

3,700,848
DIFFERENTIAL VALUE SAFETY DEVICE FOR COMPRESSED GAS CIRCUIT INTERRUPTERS

Gerard Billon; Jean Claude Henry, both of Grenoble, and Eugene Vincent, La Tronche, all of France, assignors to Merlin Gerin, Grenoble, France

Filed Feb. 11, 1971, Ser. No. 114,605
Claims priority, application France, Feb. 23, 1970, 7006450
Int. Cl. H01h 33/54
U.S. Cl. 200—148 R **6 Claims**



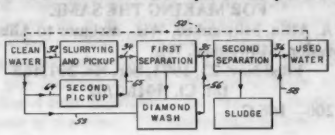
Safety device for a multibreak gas-blast circuit breaker supplied from a common pressure gas source through a gas line distribution system. A leaking branch of this system is automatically isolated by the safety device detecting a pressure difference between the feeded branches while the undamaged part of the circuit breaker remains in operation. The safety device comprises balanced three way valve means.

3,700,849
MULTIPLE GROOVING OF PAVEMENT

Edward A. Zuzelo, 652 Broad Acres Road, Narberth, Pa.

Filed Feb. 16, 1970, Ser. No. 11,470
Int. Cl. E01c 23/09
U.S. Cl. 299—18 **12 Claims**

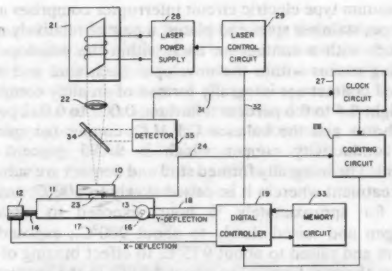
Particles of pavement removed by cutting thereof into multiple grooves to impart antiskid properties thereto are slurried with water and the slurry disposed of remote from the pavement. Particles of cutting material slurried therewith are reclaimed therefrom for reuse, and pavement particles are optionally recovered from the slurry as well. Such reclamation and recovery may be accomplished by centrifugal methods, such as hydrocycloning.



3,700,850
METHOD FOR DETECTING THE AMOUNT OF MATERIAL REMOVED BY A LASER

Robert Miller Lumley, Trenton, and Victor John Tarassov, Princeton, both of N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Sept. 4, 1970, Ser. No. 69,851
Int. Cl. B23k 27/00
U.S. Cl. 219—121 LM **19 Claims**



A pulsed or Q-switched laser removes material from a workpiece during a numerically-controlled machining process. The amount of material removed after each laser pulse is monitored by measuring the time taken for the shock waves generated by the laser pulse to traverse the remaining portion of the workpiece.

3,700,851
WELDING ELECTRODE

Jarl A. Bjorkroth, Avesta, Sweden, assignor to Avesta Jernverks Aktiebolag, Avesta, Sweden

Continuation of Ser. No. 786,472, Dec. 23, 1968, abandoned. This application June 24, 1971, Ser. No. 156,534
Int. Cl. B23k 9/00
U.S. Cl. 219—137 **4 Claims**

The invention relates to a welding electrode for electric arc welding intended for joint welding and built-up welding stainless steels, particularly steels with a ferrite-martensitic, ferrite-martensite-austenitic or martensite-austenitic structure, and is characterized in that the electrode in the shape of a bare wire or a wire with a coating deposits a weld metal whose alloying constituents affecting the structure lie within the following analysis limits: 0.01–0.05 percent carbon, 0.1–0.9 percent silicon, 0.5–4.5 percent manganese, 15.0–18.0 percent chromium, 4.5–7.5 percent nickel, 0.2–2.5 percent molybdenum, 0.02–0.12 percent nitrogen and 0.2–3.5 percent tungsten, the remainder iron apart from the unavoidable impurities. The alloying constituents shall be adapted manually in such a way that the following two equations with the chromium equivalent (Cr_e) and the nickel equivalent (Ni_e) are satisfied:

Equation 1 $Cr_e + Ni_e$ 26.0 and 32.0

Equation 2 $1.4 \times Cr_e - Ni_e$ 15.0 and 20.0

where $Cr_e = \%\,Cr + \%\,Si + \%\,Si + 0.5 \times \%\,W$

and $Ni_e = \%\,Ni + 0.5 \times \%\,Mn + (\%\,C + \%\,N - 0.03)$;

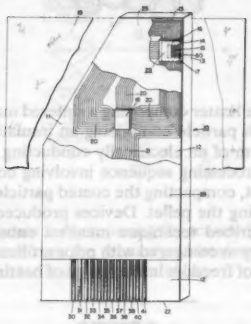
as a result the structure of the weld metal in a welded or heat treated condition contains martensite, ferrite, and austenite of such a composition that the martensite part lies between 5 and 50 percent and the ferrite plus austenite parts between 50 and 95 percent.

3,700,852

THERMAL DISPLAY MODULE

Edward M. Ruggiero, Dallas, Tex., assignor to Displaytek Corporation, Dallas, Tex.

Filed Oct. 9, 1970, Ser. No. 79,505
Int. Cl. H05b *1/00*
U.S. Cl. 219—216 **13 Claims**



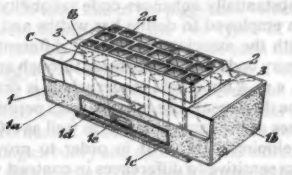
Disclosed is a thermal display module having an array of heater elements, thermal drive matrix, character generator, and deposited conductive interconnections therebetween disposed upon an insulating substrate. The heater elements and drive matrix are initially formed as integral portions of a semiconductor wafer, the wafer being mounted to the substrate at one face by way of thickened or plated up contacts on the wafer interconnecting with a conductive pattern on the substrate, the heater elements extending to the opposite face in communication with thermally sensitive record material. Trapezoidal shaped heater elements are provided as a result of a unique sequence of processing steps.

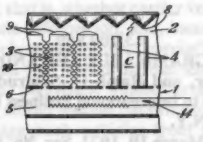
3,700,853

APPARATUS FOR HEATING OF HAIRWINDERS

Jorgen Bent Jensen; Borge Jensen; Rasmus Krohn, all of Kalundborg, and Erik Keldmann, Jerslev, all of Denmark, assignors to Bristol-Myers Company, New York, N.Y.

Filed April 26, 1971, Ser. No. 137,348
Int. Cl. A45d *4/12*; H05b *1/00*
U.S. Cl. 219—222 **8 Claims**





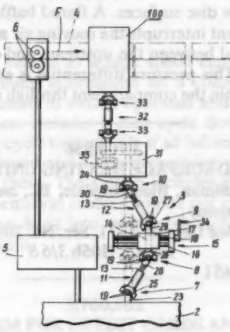
Apparatus for heating hair curlers by means of vaporized liquid which includes a chamber for holding a liquid normally applied to the hair such as water or hair conditioning agents, electrical heating means for vaporizing the liquid and a condensation chamber having curlers mounted therein. The apparatus is provided with a special lid having recesses in its outer surface and downwardly extending projections on its inner surface which may be of various shapes and configurations. The design of the lid and the projections allow for control of the amount and distribution of the condensing liquid onto the curlers. The projections correspond in number and position to the curlers as mounted in the condensation chamber and are of such shape and are so disposed above each curler as to direct the downward flow of condensed liquid from the projections onto and over the surface of each of the curlers.

3,700,854

DRIVE FOR A MOVING WELDING APPARATUS

Otto Beck, Stuttgart-Heumaden, and Georg Spalding, Stuttgart, both of Germany, assignors to Fr. Hesser Maschinenfabrik AG, Stuttgart-Bad Cannstatt, Germany

Filed March 5, 1971, Ser. No. 121,352
Claims priority, application Germany, March 7, 1970, P 20 10 961.9
Int. Cl. H05b *1/00*
U.S. Cl. 219—243 **7 Claims**



A drive including a plurality of Kardan joints, adapted to provide adjustable cyclic variations, for a movable welding or sealing equipment station effective to establish a transverse seam in a foil web movable at a uniform rate. The above equipment is used in conjunction with a machine for making, filling or closing packages.

3,700,855

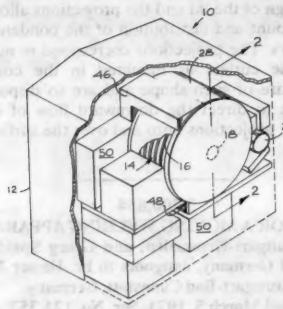
MAGNETIC DISC ASSEMBLY

Clifford J. Helms, Woodland Hills; Norman McMillan, Santa Monica, and Stelios B. Papadopoulos, Westlake Village, all of Calif., assignors to Sperry Rand Corporation, New, N.Y.

Filed Dec. 21, 1970, Ser. No. 100,242
Int. Cl. F27b *9/06*
U.S. Cl. 219—388 **8 Claims**

A magnetic disc assembly including a system for efficiently maintaining the temperature in the disc compartment at a prescribed operating level. Disc compartment temperature is maintained at a prescribed level elevated above ambient by the combined effect of moving ambient air around a cylindrical convoluted shroud surrounding the disc compartment for cooling and by selectively activating elements within the compartment for heating. The shroud is surrounded by a concentric cylindrical cover and the ambient air flows between the shroud and the cover. The heater elements serve to quickly bring the disc compartment temperature up to the elevated operating level and to add heat as required to maintain that level. The heater elements are incorporated in the compartment within the shroud convolutions and are activated in

response to a temperature sensor within the compartment. An ambient air temperature sensor controls the ambient air flow. A disc stack assembly supported in the disc compartment includes a plurality of discs mounted on a common shaft secured to a rotatable hub. In operation, the discs spin very rapidly



causing the air within the compartment to move in the same direction as the disc surfaces. A flared baffle mounted within the compartment interrupts the moving air and creates a pressure differential between the upstream and downstream sides of the baffle. This pressure differential is employed to circulate the air within the compartment through a filter.

3,700,856

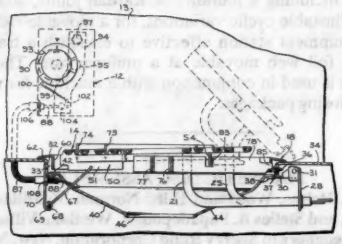
HINGED SURFACE HEATING UNIT SYSTEM

William G. Kullman, Bloomingdale, Ill., assignor to General Electric Company

Filed Dec. 20, 1971, Ser. No. 209,922

Int. Cl. H05b *3/68*

U.S. Cl. 219—451 **8 Claims**



A surface heating unit in combination with a remote selector switch that controls the flow of current to the heating unit. A metal sheathed heating means of coiled configuration is provided with hinging means for mounting the heating unit in an opening in a cooktop so that food soils may be cleaned from therebeneath. A trim ring surrounds the heating means and supports the same for slight vertical movement therebetween. A utensil support framework comprising a series of ring members is telescoped with the heating means and is attached to the trim ring. A choke cable is connected between the selector switch and the heating means so that the changing of the selector switch from an ON position to its OFF position acts to lower the heating means out of contact with a utensil carried by the utensil support framework and vice versa.

3,700,857

ELECTRICAL RESISTANCE HEATER

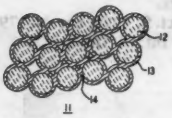
Raymond G. Brandes, Meyersville, N.J., and Charles M. Pleass, Reiffton, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 838,862, July 3, 1969, Pat. No. 3,635,824.

This application April 14, 1971, Ser. No. 133,843

Int. Cl. H05b *3/16*

U.S. Cl. 219—543 **2 Claims**



A resistance heater comprising a sintered mass of refractory particles, each particle comprising an insulating core coated with a thin film of an electrically conducting material, is obtained by a processing sequence involving coating the particles of interest, compacting the coated particles to form a pellet and sintering the pellet. Devices produced in accordance with the described technique manifest enhanced reliability and uniformity as compared with prior art heaters, and permit a new degree of freedom in the design of heating elements.

3,700,858

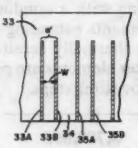
DATA PROCESSING SYSTEM EMPLOYING PARTICULAR BAR CODE CONFIGURATION

Nanjundiah N. Murthy, Redding, Conn., assignor to Pitney Bowes-Alpex, Inc., Danbury, Conn.

Filed Feb. 24, 1971, Ser. No. 118,224

Int. Cl. G06r *7/10, 9/18*

U.S. Cl. 235—61.11 E **8 Claims**



An illustrative embodiment of the invention is directed to an electro-optically readable coded document in which the code appears as a row of printed bars separated by spaces of controlled widths between the individual bars. The substitution of a pair of fine lines, termed a pulse pair, for each bar in the row, substantially enhances code reliability. These pulse pairs, when employed to define bar widths and used in combination with the associated spaces of different widths, constitute a binary code that is registered through an electro-optical system, e.g., a hand held reader which is drawn along the length of the document. Use of pulse pairs permits the generation of pulses of the same polarity, as well as AC coupled circuits that eliminate DC drift in order to provide a system which is less sensitive to differences in contrast variations and reader angle.

3,700,859

PROGRAMMABLE KEY AND LOCK

George J. Laurer, and Ralph O. Skatrud, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

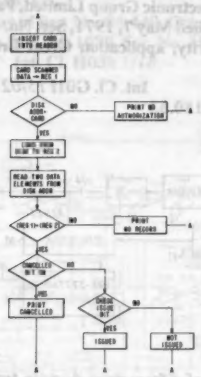
Filed March 19, 1971, Ser. No. 126,213

Int. Cl. G06k *7/10, 15/00, 19/06*

U.S. Cl. 235—61.7 R **11 Claims**

A programmable electronic lock and key in which the key consists of a card having non-visible coded indicia thereon

designating an address in memory and the contents thereof. The lock includes a card reader for scanning the coded indicia, memory means storing arbitrary patterns at designated



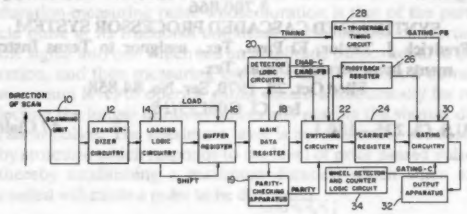
locations; and means for comparing the scanned card data and the data extracted from the memory address specified by the card. A mismatch indicates a non-valid key.

3,700,860

DATA STORAGE AND TRANSFER APPARATUS FOR PLURAL-VEHICLE IDENTIFICATION SYSTEM

Christopher C. Reynolds, Homewood, Ill., assignor to Servo Corporation of America, Hicksville, N.Y.

Filed July 26, 1971, Ser. No. 165,480
Int. Cl. G06k 7/10
U.S. Cl. 235—61.11 E 17 Claims



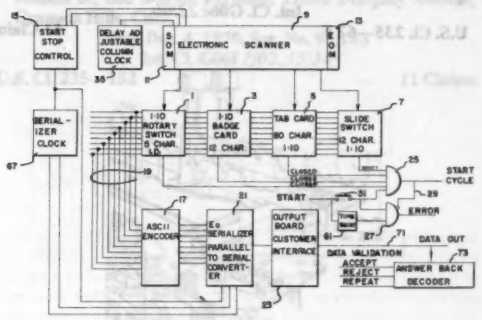
A system for identifying a carrier vehicle and piggyback vehicles positioned thereon. Each of the vehicles is equipped with an information-coded label, the information encoded in the carrier vehicle label and in the piggyback vehicle labels including features distinguishing the two types of labels and, therefore, the two types of vehicles, from each other. As the carrier and piggyback vehicles move through a label-reading area, a scanning apparatus senses the information encoded in the various labels and produces successive signals representative of the information. These signals are then processed by signal processing circuitry and applied to and stored in succession in a main data register. The signals stored in the main data register are examined by detection logic circuitry to determine the nature thereof, that is, whether carrier vehicle information or piggyback vehicle information, and, based on these determinations, selectively steered into a "carrier" register or into a "piggyback" register and stored therein. Each signal applied to and stored in the "piggyback" register is read out therefrom shortly after being stored therein but prior to the departure of the carrier and piggyback vehicles from the label-reading area. The signal stored in the " carrier" register is read out in response to the departure of the carrier and piggyback vehicles from the label-reading area. Timing circuitry is also provided in the system for preventing multiple readings of a piggyback vehicle label.

3,700,861

DATA CARD TERMINAL

Vander Heyden, and Eric Ernest, both of Hummelstown, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 19, 1970, Ser. No. 81,985
Int. Cl. G06k 7/04
U.S. Cl. 235—61.11 B 8 Claims



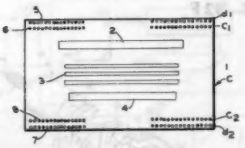
The disclosure relates to a high speed electronic scanner terminal for scanning information on a column by column basis which is located in switch operated and card operated devices. The system includes a start cycle device which permits an operating cycle to start only if all information containing devices are closed and all card receiving units have data cards inserted in them. The system includes a pair of clocks and converts information readout in one out of ten code one column by column basis into serial code compatible with a remote receiving unit.

3,700,862

INDICIA SYSTEM FOR CREDIT CARDS AND THE LIKE

Richard K. Snook, Bridgeton, and Rodney W. Stout, Webster Groves, both of Mo., assignors to Diginetics Incorporated

Filed Aug. 26, 1969, Ser. No. 853,138
Int. Cl. G06k 19/00
U.S. Cl. 235—61.12 M 11 Claims

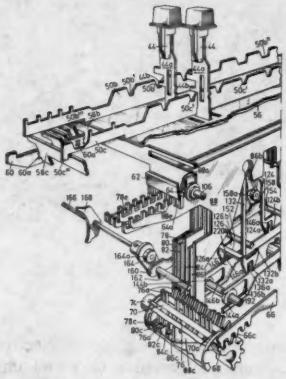


A system for imprinting indicia in binary form on credit cards and similar plastic members which includes a printing mechanism for printing two tracks of clock or synchronizing pulses and two tracks of data pulses on spaced portions of a credit card. One data track is recorded in such manner that it is a complement of the other data track in order to provide at least 100 percent redundancy. A reading system is also disclosed and which involves a gating structure for determining true states of the complementary data in each of the data tracks at clock pulse time. In addition, the reading system compensates for a condition of skew in the printing or in the reading of the card.

3,700,863
CONTROL APPARATUS

Gosta Roland Englund, Stockholm; Bjorn Sven Hilding Eriksson, Jacobsberg; Mats Erik Mattsson, Sollentuna, and Claes-Goran Lindelow, Taby, all of Sweden, assignors to Swenska Dataregister AB, Solna, Sweden

Filed Dec. 23, 1969, Ser. No. 887,667
Claims priority, application Sweden, Dec. 3, 1968, 17739/1968
Int. Cl. G06c *23/00*
U.S. Cl. 235—62 F 51 Claims

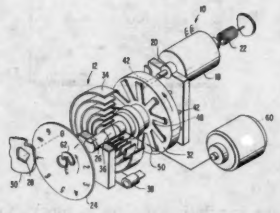


A device for performing functions in a cash register includes coupling plates which are affected by programmable cams detachably fastened to function keys and a function means movable to different positions. The cams are easily accessible and can be exchanged by other cams with different configurations in order to change the program of the function selection operations. The programmable cams on the function keys and the function means cooperate in order to affect the coupling plates which control the performance of the different functions.

3,700,864
HIGH SPEED ELECTRICAL COUNTER

John H. Knight, Dayton, Ohio, assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed March 19, 1971, Ser. No. 126,117
Int. Cl. G06m *1/10*
U.S. Cl. 235—92 F 5 Claims

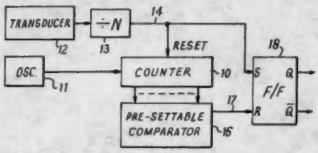


This is a high speed non-electronic counter having a solenoid to trigger a spring driven counter mechanism. The counter mechanism comprises a numerated disc and a coil spring driven wafer having spring loaded detent pins each of which engage a stop mechanism to position the numbers on the disc. Actuation of the solenoid disengages the detent from the stop to permit the coil spring to rotate the wafer and disc until the next detent engages the stop mechanism thereby positioning the number corresponding to the position of the pin and stop.

3,700,865
LINEARIZING CIRCUIT FOR FREQUENCY DOMAIN TRANSDUCERS

Anthony John Ley, Farnborough, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Filed May 7, 1971, Ser. No. 141,816
Claims priority, application Great Britain, May 12, 1970, 23001
Int. Cl. G01f *15/02*
U.S. Cl. 235—150.53 11 Claims

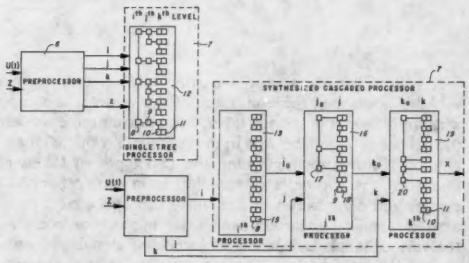


The output of a frequency domain transducer is linearized by converting the output to a mark-space signal which changes level in one sense at each pulse (or each N'the pulse) from the transducer and in the other sense when a fixed number of clock pulses have been counted from the occurrence of the transducer pulse. The mark space signal then operates on an analogue network to effect the linearization by switching the configuration of this network. The analogue network operates either on a fixed analogue signal or an analogue signal representing a second variable when it is desired to multiply the second variable by the first variable transduced by the transducer.

3,700,866
SYNTHESIZED CASCADED PROCESSOR SYSTEM

Fredrick J. Taylor, El Paso, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 28, 1970, Ser. No. 84,858
Int. Cl. G06f *15/18*
U.S. Cl. 235—150.1 47 Claims



A single trainable nonlinear processor is trained with a single pass of training data through such processor. The single processor is then converted into a system of cascaded processors. In an execution mode of operation, each processor of the synthesized nonlinear cascaded processor system generates a probabilistic signal for the next processor in the cascade which is a best estimate for that processor of some desired response. The last processor in the cascade thereby provides a minimum entropy or minimum uncertainty actual output signal which most closely approximates a desired response for the total system to any input signal introduced into the system. The system is particularly useful for identification, classification, filtering, smoothing, prediction and modeling.

3,700,867

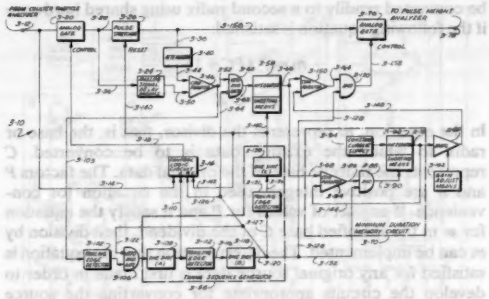
AXIAL TRAJECTORY SENSOR FOR ELECTRONIC PARTICLE STUDY APPARATUS AND METHOD

Walter R. Gogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 84,440, Oct. 27, 1970. This application Dec. 24, 1970, Ser. No. 101,325

Int. Cl. H03k 5/18

U.S. Cl. 235—151.3 **32 Claims**



A sensor for use with apparatus operating in accordance with the principles of the Coulter electronic particle studying device, for differentiating between signals from particles passing on axial or near axial paths through an aperture and particles passing off center. The pulse duration is measured at some fraction of the individual pulse amplitudes and only those which meet the criteria of duration established by the electronic circuitry are permitted to pass for use in pulse height analysis apparatus following the sensor. The other pulses are discarded on the basis of their greater durations. The apparatus of the invention provides structure for deriving a duration-measuring pulse whose duration is that of the particle pulse at its fractional amplitude, structure for converting the signal into one which has an amplitude proportional to duration, and then measuring the latter signal against a certain maximum level to operate gating means automatically for rejecting the longer duration pulses and passing the shorter duration pulses. The maximum level is automatically produced by structure which responds to the level of prior passed pulses thereby establishing a maximum duration which when exceeded will cause a pulse to be discarded.

3,700,868

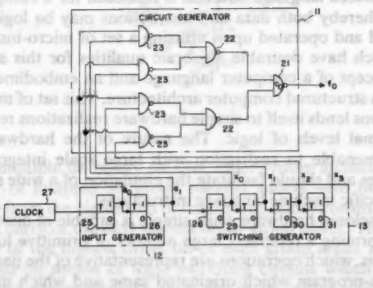
LOGICAL FUNCTION GENERATOR

Wilford E. Silvertson, Jr., Yorktown, V.I., assignor to The United States of America as represented by the National Aeronautics and Space Administration

Filed Dec. 16, 1970, Ser. No. 98,798

Int. Cl. G06f 7/38, 15/34

U.S. Cl. 235—152 **6 Claims**



Apparatus and technique for generating logical functions and circuits, and for defining the circuit connections required to generate these functions thereby providing an aid in designing and constructing hardware to generate logical circuits.

3,700,869

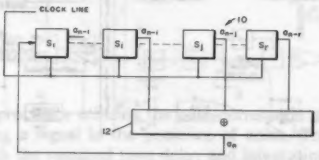
PSEUDONOISE SEQUENCE GENERATORS WITH THREE-TAP LINEAR FEEDBACK SHIFT REGISTERS

George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Marvin Perlman, 11000 Dempsey Avenue, Granada Hills, Calif.

Filed Dec. 4, 1970, Ser. No. 95,183

Int. Cl. G06f 1/02, 15/34

U.S. Cl. 235—152 **11 Claims**



A PN linear recurring binary sequence generator is described. It comprises a linear feedback shift register of r stages with three-tap feedback logic. The three stages which are fed back are *i*, *j* and *r*, wherein $i<j<r$. The stages *i*, *j* and *r* are selected to correspond to the exponents of a tetranomial which includes either an $(r-1)^{th}$ degree or an $(r-2)^{th}$ degree primitive polynominal over GF(2) as a factor. The PN sequence length is $2^{r-1}-1$ or $2^{r-2}-1$ when the shift register is properly initialized.

3,700,870

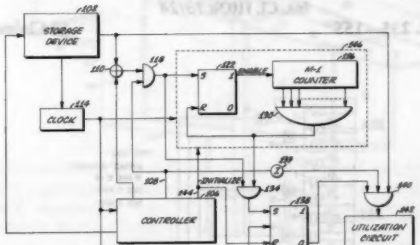
ERROR CONTROL ARRANGEMENT FOR ASSOCIATIVE INFORMATION STORAGE AND RETRIEVAL

Thomas H. Howell, Scottsdale, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed April 9, 1971, Ser. No. 132,860

Int. Cl. G11c 29/00, 15/00

U.S. Cl. 235—153 **9 Claims**



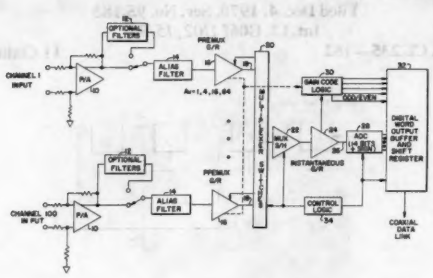
Data key words, encoded in a certain error correcting code, are read from a storage device and compared with a similarly encoded master key word. If, for any pair of words compared, the pattern of digit positions having differing digits does not correspond to an error pattern which is correctable by the error correcting code, then a mismatch between the pair is assumed. If, on the other hand, the pattern of digit positions having differing digits does correspond to a correctable error pattern, then a match is assumed. The stored data associated with the matching or mismatching data key word may then be utilized in accordance with the outcome of the comparison.

3,700,871

MULTIPLE MULTIPLEXER GAIN-RANGING AMPLIFIER

William C. Montgomery, Jr., and Charles B. Vogel, both of Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Continuation-in-part of Ser. No. 864,998, Oct. 9, 1969. This application June 21, 1971, Ser. No. 155,084
Int. Cl. G01v 1/28 ; H03r 13/02
U.S. Cl. 235—154 4 Claims



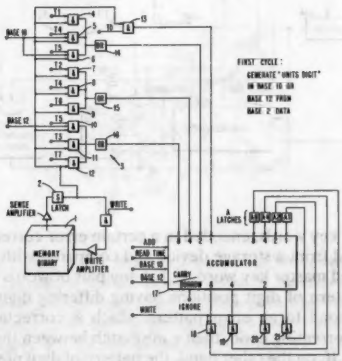
One hundred low frequency analog signal channels having a very large dynamic range may be amplified to at least half of full scale of a 14-bit analog to digital converter without distortion by an amplifier system that includes a preamplifier for each channel, a filter system for each channel, a gain-ranging multiplexer time-shared between 10 channels, and a second multiplexer that time shares the output of the gain-ranging multiplexers with an instantaneous gain-ranging amplifier. The gain-ranging multiplexer performs part of the multiplexing function and supplies sufficient gain ahead of the second multiplexer, a high speed, higher noise level multiplexer to mask the noise introduced into the system thereby. The output of the system is typically digitized.

3,700,872

RADIX CONVERSION CIRCUITS

Frederick T. May, Austin, Tex., assignor to International Business Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 517,764, Dec. 30, 1965, abandoned. This application Aug. 22, 1969, Ser. No. 852,272
Int. Cl. H03k 13/24
U.S. Cl. 235—155 10 Claims



Data conversion circuits with optimized common hardware convert numbers expressed in a first radix C to other radices $m1$, $m2$, etc., with the mode of operation being controlled to establish a radix C to radix $m1$ conversion in one mode, a radix C to radix $m2$ conversion in another mode, etc., on a selective basis, as desired. In a first embodiment, numbers represented in a binary (base 2) radix C are converted to a base 10 ($m1$) or base 12($m2$) representation. In a second embodiment, numbers stored in a ternary (base 3) radix C representation are converted to a base 12 ($m1$) or base 10 ($m2$) representation. The circuits are predicated upon recognition of the fact that a number represented in a first radix can be converted readily to a second radix using shared hardware if the following equation is satisfied:

$$m=C^n(PC+1)$$

$$m=C^nX$$

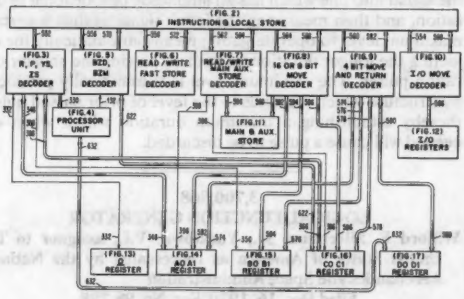
In the equation, m represents the divisor, that is, the base or radix to which the existing data is to be converted. C represents the radix or base of the original data. The factors P and n are positive integers used in the equation for convenience. If any set of values for P and n satisfy the equation for m in the specified base C of the dividend, then division by m can be implemented. The determination that the equation is satisfied for any original source data is first made in order to develop the circuits appropriate for converting the source data to other radices.

3,700,873

STRUCTURED COMPUTER NOTATION AND SYSTEM ARCHITECTURE UTILIZING SAME

Ernesto F. Yhap, New York, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed April 6, 1970, Ser. No. 26,029
Int. Cl. G06f 7/38
U.S. Cl. 235—156 17 Claims


(FIG. 2)
μ INSTRUCTION & LOCAL STORE
(FIG.3) R, P, YR, ZS DECODER
(FIG. 5) BCD, BZM DECODER
(FIG.6) READ/WRITE FAST STORE DECODER
(FIG.7) READ/WRITE MAIN AUX. STORE DECODER
(FIG.8) 16 OR 9 BIT MOVE DECODER
(FIG.9) 4 BIT MOVE AND RETURN DECODER
(FIG.10) Σ/O MOVE DECODER
(FIG.4) PROCESSOR UNIT
(FIG.11) MAIN & AUX STORE
(FIG.12) Σ/O REGISTERS
(FIG.13) Q REGISTER
(FIG.14) AQ A1 REGISTER
(FIG.15) BQ B1 REGISTER
(FIG.16) CQ C1 REGISTER
(FIG.17) DQ D1 REGISTER

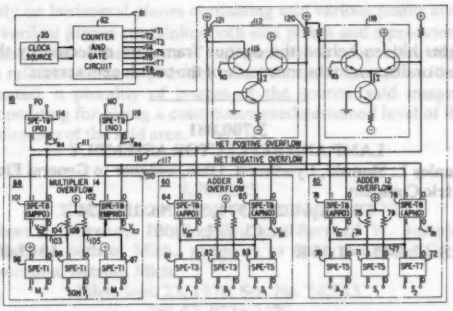
An idealized language notation is disclosed for a computer system whereby both data and instructions may be logically combined and operated upon utilizing a set of micro-instructions which have desirable algebraic qualities for this structural concept of a computer language and an embodiment is given of a structured computer architecture. This set of micro-instructions lends itself to simple hardware realizations requiring minimal levels of logic. The nature of the hardware is highly amenable to realization with large scale integration techniques and should facilitate the emulation of a wide set of more specific machine language instructions.

The disclosed hardware while simple is capable of decoding and performing a relatively large number of primitive logical operations, which operations are representative of the particular micro-program which originated same and which micro-programs are further combinable to perform all normal machine operations.

3,700,874
THRESHOLD LOGIC OVERFLOW DETECTOR

John Donnell Heightley, Basking Ridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed March 4, 1971, Ser. No. 120,833
Int. Cl. G06f 7/48
U.S. Cl. 235—164 12 Claims

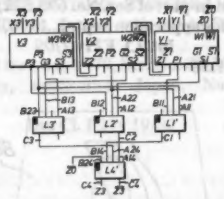


An overflow detector circuit for a digital filter comprises threshold logic arrangements that detect the occurrence and the polarity of any overflows generated in two adders and a multiplier. In addition, threshold logic circuitry detects all possible net overflow conditions of either polarity resulting from computations made in the adders and the multiplier. Every net overflow signal corrects for the net overflow condition.

3,700,875
PARALLEL BINARY CARRY LOOK-AHEAD ADDER SYSTEM

Franz Saenger, and Dieter Straub, both of Konstanz, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Feb. 18, 1971, Ser. No. 116,585
Claims priority, application Germany, Feb. 18, 1970, P 20 07 353.4
Int. Cl. G06f 7/50
U.S. Cl. 235—175 4 Claims

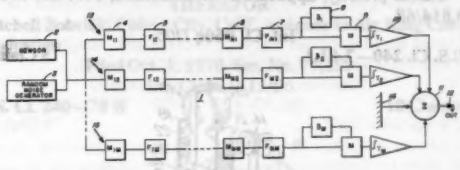


A multiple bit binary parallel adder system including a plurality of multiple bit group parallel adders with the output carry from the highest-bit of each group adder constituting the input carry of the next highest order group adder. The output carry of the highest order bit of each group adder is rapidly formed by means of logic switching circuits which compile values corresponding to all of the input values to the group adder while the remaining output carries within the group adders are formed as conventional propogated carries.

3,700,876
REDUCED TIME DELAY AUTO-CORRELATION SIGNAL PROCESSOR

Lawrence S. Gray, Virginia Beach, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 9, 1970, Ser. No. 97,450
Int. Cl. G06g 7/19
U.S. Cl. 235—181 10 Claims

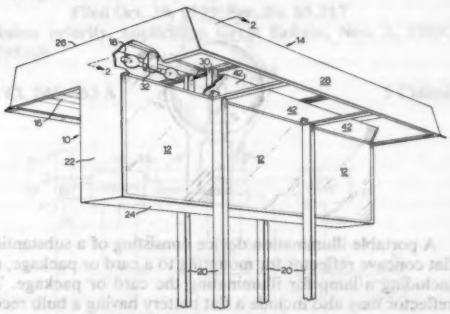


A signal processor utilizing the auto-correlation technique for detecting a signal in the presence of noise. The device reduces both the required time delay and integrating time in conventional auto-correlation processes by the use of a (N) by (M) matrix analog correlator. The device accepts noise and signal which are assumed to be statistically independent and by linearly multiplying both (N) reiterated times and filtering out the d.c. or base band products from each multiplication, forms the final function for correlation. This process of linear multiplication is repeated over (M) parallel paths. The (N) reiterated linear multiplications reduce the required time delay to a small fraction. The (M) parallel paths reduce the required integrating time also to a very small fraction.

3,700,877
LIGHTING STRUCTURE

Arthur K. Wilson, 50 Coleman Avenue, Toronto, Ontario, Canada

Filed Aug. 11, 1971, Ser. No. 170,848
Int. Cl. F21p 5/00
U.S. Cl. 240—3 9 Claims



Lighting structure is described for both illuminating display panels associated therewith and for providing illumination to the area surrounding the structure. A plurality of mercury vapor lamps are disposed above and rearwardly of a display panel whilst a reflector extends forwardly of said panel above said lamps whereby said panel is illuminated on its rear face by direct transmission of light from said lamps and on its front face by reflected light; the area surrounding the structure being illuminated by light reflected from said reflectors and light transmitted through said panel. Said area may also be illuminated by direct light transmitted through a translucent baffle located above said panel below said reflector, or said translucent baffle may be omitted altogether. Alternatively, direct illumination of said area may be prevented by means of

a grating-like baffle extending forwardly of and above the or each display panel.

3,700,878

LIGHTING SYSTEMS FOR ROAD VEHICLES

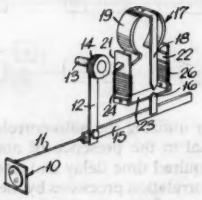
Alfred Dickens Baker, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Continuation of Ser. No. 796,326, Feb. 4, 1969, abandoned. This application May 14, 1971, Ser. No. 143,641

Claims priority, application Great Britain, Feb. 23, 1968, 8,814/68

Int. Cl. B60q 1/06

U.S. Cl. 240—7.1 LJ **5 Claims**



In a lighting system for a road vehicle automatic sensing means senses the attitude of the body of the road vehicle relative to the ground and operates a first indicator means within the vehicle so that the occupant knows the attitude of the vehicle relative to the ground. There is also control means operable by an occupant of the vehicle for adjusting the attitude of the headlamp and a second indicator means, which can be brought into alignment with the first indicator means by adjusting the headlamp to the correct position.

3,700,879

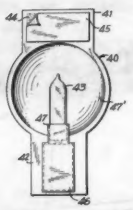
ILLUMINATION DEVICE

Charles Franc, Box 36-R Wading River, New York, N.Y.

Continuation-in-part of Ser. No. 755,303, Aug. 26, 1968, abandoned. This application Oct. 8, 1970, Ser. No. 79,040

Int. Cl. F21b 1/02

U.S. Cl. 240—10 R **7 Claims**



A portable illumination device consisting of a substantially flat concave reflector for mounting to a card or package, and including a lamp for illuminating the card or package. The reflector may also include a flat battery having a bulb receiving connector for receiving a lamp. The illumination device may be supported from a wire or string, or mounted on a vertical edge.

3,700,880

DISPLAY SYSTEM

Victor S. Smith, Channing House, Wargrave, England

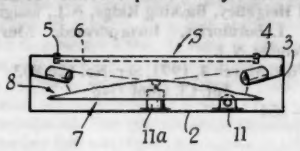
Continuation-in-part of Ser. No. 813,953, April 7, 1969, Pat. No. 3,609,339. This application Dec. 8, 1970, Ser. No. 96,092

Claims priority, application Spain, Dec. 12, 1969, 374478/69

Int. Cl. F21p 1/02

U.S. Cl. 240—10 R **6 Claims**

A shallow box-like housing has a front wall composed of a translucent screen surrounded by an opaque frame. Within the housing is or are one or more rotating discs faced with randomly oriented reflective plastic. Rays from a plurality of



lights hidden behind the opaque frame are reflected by the disc or discs onto the inner side of the translucent screen.

3,700,881

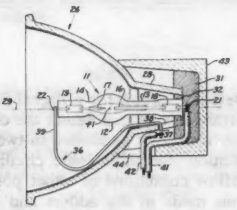
LAMP AND REFLECTOR ASSEMBLY

Stanley L. Slomski, Lyndhurst, Ohio, assignor to General Electric Company

Filed April 29, 1971, Ser. No. 138,474

Int. Cl. F21v 7/00

U.S. Cl. 240—41.35 R **10 Claims**



A high-intensity arc lamp having anode and cathode stems extending in opposite directions from the bulb, is positioned in a reflector. The anode stem extends within a tapered hollow collar at the rear of the reflector, and the lamp is attached to the reflector by means of cement at the remote ends of the anode stem and hollow collar, whereby the hollow collar provides a heat-confining space around the anode stem for controlling the temperature and reducing the likelihood of thermal-stress cracking of the anode stem. A specially shaped connector within the reflector provides electrical connection to the cathode lead.

3,700,882

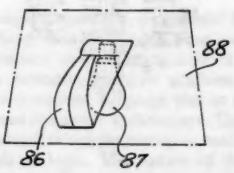
FACETED REFLECTOR

Jean Planchon, 9, rue Chaptal, Paris 9eme, France

Continuation-in-part of Ser. No. 695,522, Jan. 3, 1968, abandoned. This application Sept. 2, 1970, Ser. No. 68,951

Int. Cl. F21v 7/09

U.S. Cl. 240—41.36 **3 Claims**



The present invention provides a reflector, e.g. for a desk lamp, which is designed to provide an unusual predetermined pattern of illumination on a surface, for instance a pattern having non-concentric isolux curves around a point of strongest illumination, and which results in a more even distribution of light over the surface illuminated. The reflector is particularly designed for uniformly illuminating a predetermined area, even at a comparatively large distance from the vertical

projection of the light source on the said area. For that purpose, the reflector is built in the form of a complex surface comprising a plurality of elementary reflecting surfaces each of which has a distinct shape.

The elementary reflecting surfaces are linked to one another at their upper and lower edges through continuous surfaces portions and at their lateral edges through stepped surfaces portions called redans. The horizontal and vertical traces of the tangent planes to the various points of said individual elementary reflecting surfaces are so located respectively on horizontal planes containing said various points and on vertical planes containing both said points and a predetermined point of the source of radiation which cooperates with the reflector so as to provide, on a horizontal area to be illuminated, a plurality of images of the source, said images cooperating for giving a continuous predetermined level of illumination of the said area.

3,700,883

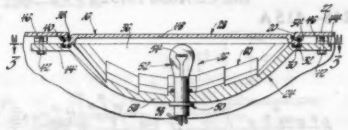
FACETED REFLECTOR FOR LIGHTING UNIT

Robert J. Donohue, Birmingham, and Bernard W. Joseph, Berkley, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 23, 1970, Ser. No. 74,563

Int. Cl. F21v *7/09*

U.S. Cl. 240—41.36 **4 Claims**



A reflector for a lighting unit includes a plurality of discrete reflecting facets which are individually oriented with respect to a light source such that the superposition of the reflected images synthesizes a predetermined lighting pattern. The prescription for making the reflector, by the techniques disclosed herein, involves selecting the number, size, curvature, and location of each facet to produce undistorted reflected images of the light source, the cumulative effect of which produces the desired illumination distribution within prescribed limits. Glare from the lighting unit is substantially eliminated by positioning contiguous facets such that uncontrolled reflecting surfaces are shaded from the light source.

3,700,884

DEVICE FOR ADJUSTING POSITION OF LIGHT SOURCE FOR PROJECTORS AND THE LIKE

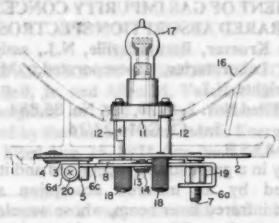
Sakae Fujimoto, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1970, Ser. No. 88,304

Claims priority, application Japan, Nov. 12, 1969, 44/107399

Int. Cl. F21v *19/02*

U.S. Cl. 240—44.2 **2 Claims**



A device is provided for precisely positioning a light source in the optical system of a projector or the like, especially relative to a condenser system and a reflecting mirror. It consists of two position adjustment members, one being adjustable along two coordinate axes and the other being adjustable along the third coordinate axis. It is extremely compact in size, especially in thickness and is well adapted for miniaturization of a projector or the like. It is also very simple in operation to attain a highly uniform field with high luminance.

3,700,885

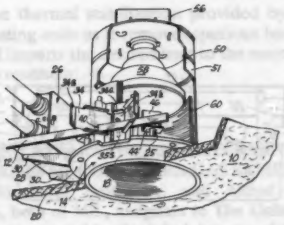
ARCHITECTURAL LIGHT AND ADJUSTMENT MEANS THEREFOR

Mitchell Bobrick, Culver City, Calif., assignor to Air King Corporation

Filed Oct. 1, 1970, Ser. No. 77,259

Int. Cl. F21s *13/06*

U.S. Cl. 240—78 H **10 Claims**



A recessed lighting fixture is provided with a frame adapted for adjustable mounting longitudinally on hanger bars, and a light-carrying can which can be adjusted axially with respect to the frame without using tools. Spring-biased gripping members are provided for both adjusting the position of the frame on the hanger bars and for permitting transverse adjustment of the can relative to the frame.

3,700,886

COMMUNICATION SYSTEMS BETWEEN A TRACKWAY AND VEHICLES

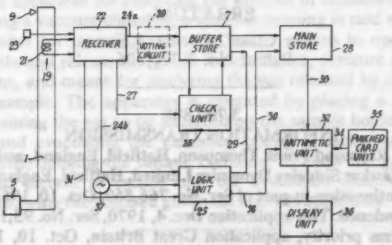
Michael Sambrook Birkin, Derby, England, assignor to British Railways Board, London, England

Filed Oct. 30, 1970, Ser. No. 85,317

Claims priority, application Great Britain, Nov. 3, 1969, 53,895/69

Int. Cl. B61l *1/08*

U.S. Cl. 246—63 A **5 Claims**



A communication system is provided between a trackway and a vehicle running along the trackway, in which information is transmitted between the trackway and the vehicle through an energy coupling such as an inductive coupling between a conductor system laid along the trackway and a pickup aerial on the vehicle. The trackway is divided into sections for each of which respective geographical information is valid for use by a vehicle in that section. An information transmitter is provided on the trackway for transmitting to a vehicle, while it is in a section, geographical information relevant

to a section of the trackway ahead. An information store such as a buffer store of a computer is provided on the vehicle for storing the geographical information. Signalling means are provided on the trackway for causing the stored information to be transferred from the storage means to information processing means on the vehicle, i.e., from the buffer store to the main store of the computer when the stored information becomes valid for use.

3,700,887

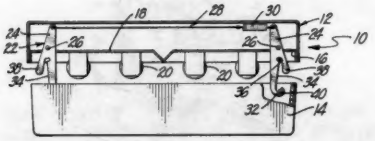
LATCH AND HINGE STRUCTURE FOR DIFFUSER OF FLUORESCENT LIGHT FIXTURE

George M. Marx, Palos Verdes Estates, Calif., assignor to Nu-Lite Fluorescent Mfg. Co., Inc., Commerce, Calif.

Filed Oct. 6, 1971, Ser. No. 186,863

Int. Cl. F21v 17/00

U.S. Cl. 240—147 **3 Claims**



A combination hinge and latch structure for the diffuser of a fluorescent light fixture, comprising at each end of the fixture two transversely spaced, transversely pivotable latch members on the housing of the fixture spring biased into engagement with two latch elements on the diffuser. The latch members are provided at their lower ends with transversely-outwardly-facing hooks and transversely-outwardly-facing cam surfaces which extend upwardly from the hooks to transversely-outwardly-facing notches in the latch members. The latch elements are engageable with the hooks to support the diffuser in a lowered position, and are slidable upwardly along the cam surfaces into the notches to support the diffuser in a raised position. When the diffuser is in its lowered position, one latch element of each pair can be disengaged from the corresponding hook to permit the diffuser to swing downwardly for access to the interior of the housing. Fingers on the latch members transversely outwardly from the notches therein are engageable with the diffuser to prevent unhooking of one side of the diffuser when the other side thereof is unhooked.

ERRATUM

For Class 246—63 A see:
Patent No. 3,700,886

3,700,888

INFORMATION TRANSMISSION

Lionel Raymond Frank Thompson, Hatfield, England, assignor to Hawker Siddeley Dynamics Limited, Hatfield, England

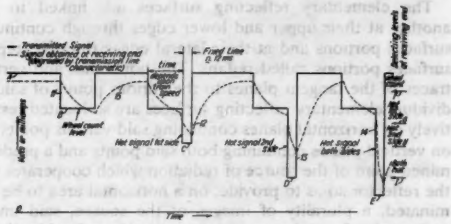
Continuation-in-part of Ser. No. 766,569, Oct. 10, 1968, abandoned. This application Dec. 4, 1970, Ser. No. 95,116

Claims priority, application Great Britain, Oct. 10, 1967, 46,249/67

Int. Cl. B61k 9/06

U.S. Cl. 246—169 D **7 Claims**

An electrical signal transmission system, applicable to the transmission of signals from trackside hot box detector equipment for railroad locomotives and rolling stock, wherein a basic pulse train is transmitted whereof the pulses are of a selected first amplitude and represent a train axle count, and a spike pulse of greater selected amplitude is transmitted, occurring immediately after the axle count pulse to which it relates, whenever an overheated axle box is detected. To enable the signal receiving equipment to determine on which side of a train the overheated box is located, the spike pulses are of two



different amplitudes corresponding, respectively, to opposite sides of the train.

3,700,889

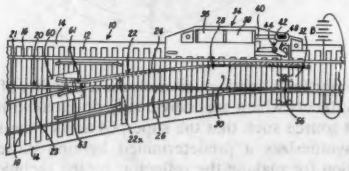
MODEL RAILWAY SWITCH ASSEMBLY

Clarence K. Edwards, 865 Morrison Street, and Lawrence D. Edwards, 2816 Rosemont Avenue, both of Medford, Oreg.

Filed July 29, 1971, Ser. No. 167,263

Int. Cl. A63h 19/32

U.S. Cl. 246—415 A **4 Claims**



A model railway switch assembly is provided for the kind in which the switch includes blades or rails depended upon both (*a*) for controlling which of two track forks a locomotive or train will be delivered onto from a main track section, and (*b*) for delivering electrical energy selectively through the two track forks to operating instrumentalities on the locomotive and/or the cars.

Firm but yielding conductive pressure of both ends of either switch rail with required cooperating rails is assured by making the switch rails independently yieldable so that either rail, seemingly blocked against completion of the switchover operation, may be caused to complete such operation, thereby to establish and maintain the required mechanical and electrical relationships.

3,700,890

MEASUREMENT OF GAS IMPURITY CONCENTRATION BY INFRARED ABSORPTION SPECTROSCOPY

Lloyd Barton Kruezer, Bernardsville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

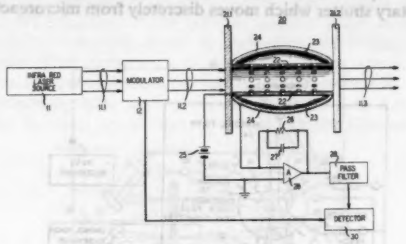
Filed Nov. 2, 1970, Ser. No. 85,884

Int. Cl. G01n 21/26

U.S. Cl. 250—43.5 R **9 Claims**

An impurity in a gas medium is detected and its concentration measured by an infrared absorption spectroscopy technique. An infrared laser beam, whose wavelength is at or near an absorption line of the suspected impurity, is amplitude modulated at a fundamental acoustic frequency; and the modulated beam is incident upon the gas medium. The am-

plitude of the second harmonic acoustic frequency component of the resulting induced pressure (or temperature) variation of the gas medium is indicative, with great sensitivity, of the presence and concentration of the impurity.



3,700,891

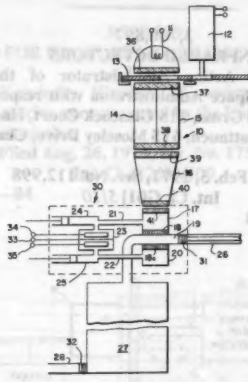
DEVICE FOR THE NONDISPERSIVE INFRARED GAS ANALYSIS

Karl Friedrich Luft, am Wunnesberg 32, Essen, Germany

Continuation-in-part of Ser. No. 745,197, July 16, 1968, abandoned. This application May 12, 1971, Ser. No. 142,616

Int. Cl. G01n *21/26*

U.S. Cl. 250—43.5 R **8 Claims**



This invention comprises a device for detecting and measuring a gas component of a gas mixture using the optical-pneumatic effect produced by absorption of infrared radiation by a gas. The device comprises, in optical alignment, a radiation source, filter means, a cuvette system and a receiver unit which contains a measuring chamber and a comparison chamber. Pressure differential means such as a diaphragm condenser measures the optical-pneumatic effect produced by the absorption of radiation. The device is provided with porous means for flow of gases to eliminate interfering fluctuations in gas flow.

3,700,892

SEPARATION OF MERCURY ISOTOPES

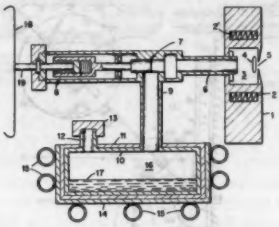
William A. Bell, Jr, and Allen M. Veach, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Aug. 25, 1971, Ser. No. 174,841

Int. Cl. H01j *39/34*

U.S. Cl. 250—41.9 S **4 Claims**

An improvement in apparatus for the electromagnetic separation of the isotopes of mercury consists of a reservoir containing elemental mercury for placement within the ion source of the apparatus wherein the reservoir is enveloped in heating coils adapted for liquid flow therein and the assemblage is further enclosed in a soft-solder-filled outer shell of good thermal conductivity. Improved isotopic separations result from the thermal stabilization provided by the liquid flow in the heating coils as it removes spurious heat from the ion source and imparts the desired heat to the mercury charge material in the reservoir.



3,700,893

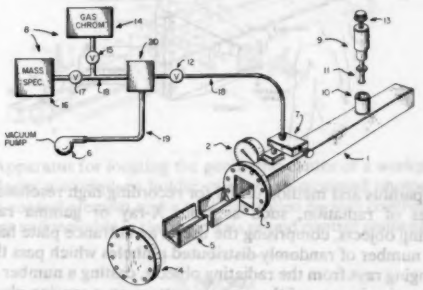
METHOD AND APPARATUS FOR DETERMINING THE CONTENTS OF CONTAINED GAS SAMPLES

Benjamin Seidenberg, Baltimore, and Alfred J. Hobbs, Middletown, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Feb. 12, 1971, Ser. No. 114,846

Int. Cl. B01d *59/44*

U.S. Cl. 250—41.9 S **1 Claim**



An apparatus for analyzing gas samples in containers comprising a vacuum chamber, a sealable opening in said vacuum chamber for inserting a sample holder, means to open said sample and release the gas in the container, pressure sensing means, and means for analyzing the gas released by opening the sample. The apparatus is operated by placing a sample containing the gas to be analyzed on the sample holder, sealing and evacuating the chamber, taking a background gas analysis, opening the sample container to allow the gas contained therein to escape into the evacuated chamber and withdrawing the released gas to the analysis apparatus.

3,700,894

PATIENT POSITIONING APPARATUS FOR USE IN TAKING MEDICAL X-RAYS

Lulu B. Counsell, 1101 "O" Avenue, La Grande, Oreg.

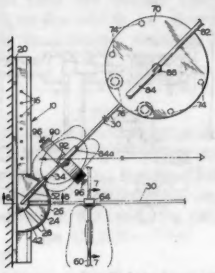
Filed Jan. 18, 1971, Ser. No. 107,218

Int. Cl. G01n *23/00*

U.S. Cl. 250—50 **10 Claims**

Patient positioning apparatus for use in taking medical X-rays is designed for properly aligning the patient at the optimum angle to the X-ray camera and film. The apparatus includes a base, a horizontal arm, angle indicating means on the

base, and arm mounting means for mounting the arm on the base at a horizontal angle selected on the angle indicating means. A head clamp also is provided. The horizontal arm and



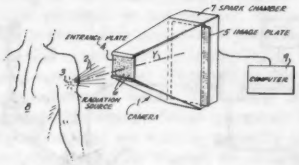
head clamp are so arranged as to require the patient to place his feet in alignment with the arm, and his head in alignment with his feet. This aligns his entire body at the desired angle with respect to the X-ray apparatus.

3,700,895

SCATTERHOLE CAMERA AND METHOD FOR USING SAME INCLUDING THE STEP OF CONVOLUTING THE IMAGE

Robert H. Dicke, Princeton, N.J., assignor to Research Corporation, New York, N.Y.

Filed Aug. 14, 1969, Ser. No. 849,954
Int. Cl. G03b *41/16*
U.S. Cl. 250—65 R **20 Claims**



Apparatus and method useful for recording high resolution images of radiation, such as from X-ray or gamma ray-emitting objects, comprising the use of an entrance plate having a number of randomly distributed pinholes which pass the impinging rays from the radiating objects, casting a number of overlapping images of the pinhole pattern on a sensing plate, which may be in the form of a photographic film, spark chamber or other readout or recording means. A comparison of the pinhole pattern with the overlapping image pattern by evaluating their convolution integral, which may be accomplished by one or more optical methods, such as passing radiation through the two patterns as they are successively shifted with respect to each other, or digitally on a computer will provide a high resolution reconstruction of the pattern of the radiation sources in the object field.

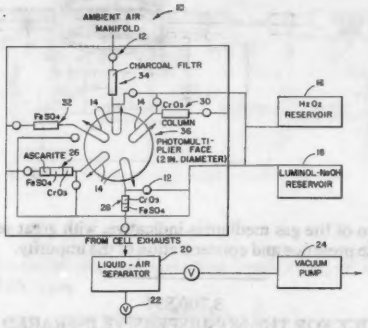
3,700,896

CHEMILUMINESCENCE AIR POLLUTANTS MONITORING DEVICE

Howard H. Anderson, Covina; Rudolph H. Moyer, West Covina; Donald J. Sibbett, Cucamonga, and David C. Sutherland, El Monte, all of Calif., assignors to Geomet, Incorporated, Rockville, Md.

Continuation-in-part of Ser. No. 63,844, Aug. 14, 1970, Pat. No. 3,659,100. This application Sept. 10, 1970, Ser. No. 71,057
Int. Cl. G01n *21/52*
U.S. Cl. 250—71 R **17 Claims**

Device or apparatus for chemiluminescence air pollutants monitoring including a plurality of microreactors simultaneously active to receive ambient air and reagents, monitoring of the microreactors being accomplished sequentially by a single photomultiplier and wherein channel monitoring is controlled by a rotary shutter which moves discretely from microreactor



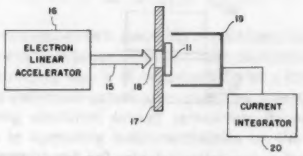
to microreactor, the microreactors consisting of channels. A quantitative analysis of gaseous components of the atmosphere is obtained by comparison of the signals obtained from the separate channels with appropriate calibration standards and processing circuitry.

3,700,897

INFRARED DETECTORS

George M. Low, Acting Administrator of the National Aeronautics & Space Administraton with respect to an invention of; Chris Gross, 118 Glascock Court, Hampton, Va., and Robert J. Mattauch, 615 Moseley Drive, Charlottesville, Va.

Filed Feb. 5, 1971, Ser. No. 112,998
Int. Cl. G01j *5/10*
U.S. Cl. 250—83 R **4 Claims**



High quality performance infrared photodetectors and a method for making them from a semiconductor material. The semiconductor material is irradiated with an electron beam to produce defect levels in a semiconductor material thereby improving the performance of the photodetectors.

3,700,898

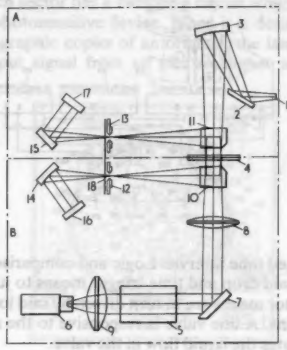
INSTRUMENTS FOR ANALYZING SUBSTANCES BY DETERMINING THEIR RADIATION ABSORPTION CHARACTERISTICS

Hugh Angus McIntosh Macleod, Newcastle-upon-Tyne, England, assignor to Sir Howard Grubb Parson & Company Limited, Walkergate, Newcastle-upon-Tyne, England

Filed Feb. 3, 1971, Ser. No. 112,377
Claims priority, application Great Britain, Feb. 3, 1970, 5,076/70
Int. Cl. G01j *3/02*
U.S. Cl. 250—83.3 H **6 Claims**

An instrument for analyzing substances by determining their radiation absorption characteristics when subjected to a beam of radiation, wherein, the optical components of the instrument are mounted on support members which lie in at

least two intersecting planes. The support members may take the form of two flat plate members lying at an angle to one



another in the manner of a pitched roof with the optical components supported on each flat member.

3,700,899

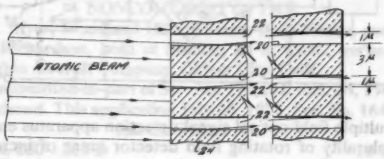
METHOD FOR PRODUCING A BEAM OF POLARIZED ATOMS

Manfred S. Kaminsky, Hinsdale, Ill., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Aug. 26, 1971, Ser. No. 175,245

Int. Cl. G21k *1/00*

U.S. Cl. 250—84 **11 Claims**



A polarized beam of atoms is generated by forming a plurality of apertures of micron-sized diameter through a magnetically saturated monocrystalline material and passing in a partial vacuum a collimated beam of atoms through said apertures incident to the walls thereof. The monocrystalline material effects a charge-transfer reaction with the atomic beam to produce a polarized beam of atoms, the nuclei of which are subsequently polarized by hyperfine interaction in a weak external magnetic field.

3,700,900

DUAL PURPOSE TRANSMISSION LINE

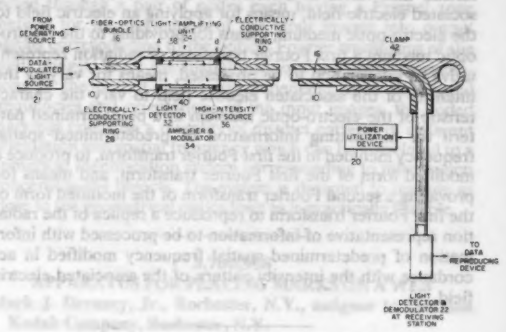
Arne J. Herleikson, 732 W. Highland Drive, Camarillo, Calif.

Filed Feb. 6, 1969, Ser. No. 798,858

Int. Cl. H04b *9/00*

U.S. Cl. 250—199 **10 Claims**

A high-voltage power transmission line in the form of a hollow tubular conductor which serves as a conduit for a high-intensity light beam modulated with data having security requirements. The high voltage of the power line effectively



precludes unauthorized access to the data carried by the light beam enclosed therewithin.

3,700,901

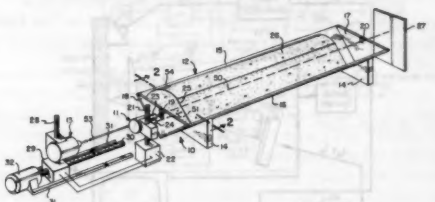
APPARATUS FOR LOCATING THE GEOMETRIC CENTER OF A WORKPIECE

Edwin Broslaw, Lincoln Park, N.J., assignor to Crest-Foam Corporation, Moonachie, N.J.

Filed Aug. 21, 1970, Ser. No. 65,788

Int. Cl. G01j *1/26*; G01n *21/30*; G05b *1/00*

U.S. Cl. 250—201 **9 Claims**



Apparatus for locating the geometric center of a workpiece includes a workpiece holder, a movably mounted photoelectric control element and a tool controlled by said control element and movable in the same axis as said control element.

3,700,902

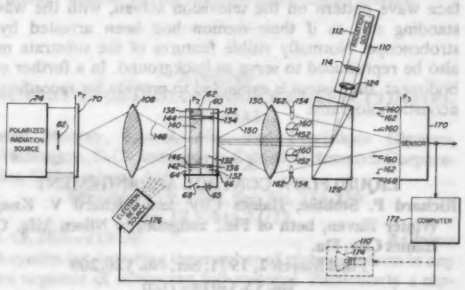
OPTICAL INFORMATION PROCESSING USING VARIABLE ELECTRO-OPTIC SPATIAL FILTER

William R. Buchan, Lincoln, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Jan. 13, 1971, Ser. No. 106,075

Int. Cl. G01j *1/20*; G06g *9/00*

U.S. Cl. 250—201 **1 Claim**



Apparatus is disclosed including an optical information processing system including a variable electro-optic spatial

filter including an electro-optic medium having a characteristic that varies as a function of the intensity of an associated electric field, means for applying an electric field to the electro-optic medium, means for providing to the electro-optic medium a first Fourier transform of radiation representative of information to be processed, means for varying the intensity of the associated electric field to vary the characteristic of the electro-optic medium in a predetermined pattern for modulating information of predetermined spatial frequency included in the first Fourier transform, to produce a modified form of the first Fourier transform, and means for providing a second Fourier transform of the modified form of the first Fourier transform to reproduce a replica of the radiation representative of information to be processed with information of predetermined spatial frequency modified in accordance with the intensity pattern of the associated electric field.

3,700,903

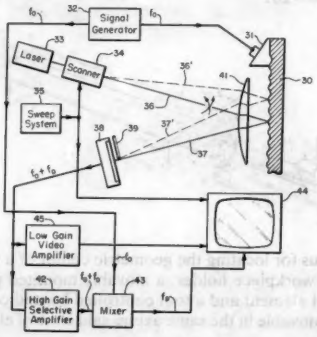
OPTICAL DETECTING SYSTEMS FOR SENSING VARIATIONS IN THE LATERAL MOTION OF LIGHT RAYS

Robert Adler, Northfield, and Adrianus Korpel, Prospect Heights, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Continuation of Ser. No. 763,682, Sept. 30, 1968, abandoned. This application Dec. 9, 1970, Ser. No. 96,581

Int. Cl. G01b *11/30*; **G01n** *21/30, 21/48*

U.S. Cl. 250—217 **4 Claims**



An instrument is described which renders Rayleigh or surface waves visible on a television screen. A flying spot scanner uses a laser beam to scan a substrate horizontally and vertically at standard television rates. The periodic tilting or warping of the surface caused by the passage of an acoustic wave modulates the light reflected from the surface. This modulation is picked up by a photocell, filtered, amplified and heterodyned with a reference signal taken from the sound generator. The resulting difference signal reproduces the surface wave pattern on the television screen, with the waves standing still as if their motion had been arrested by a stroboscope. Normally visible features of the substrate may also be reproduced to serve as background. In a further embodiment, the system is expanded to provide for recording of acoustic holograms.

3,700,904

LIQUID FLOW CONTROL ARRANGEMENT

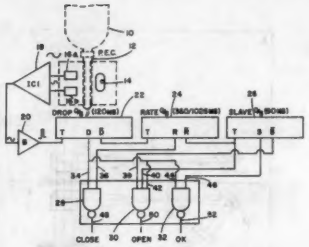
Richard P. Stobble, Haines City, and Richard V. Knapp, Winter Haven, both of Fla., assignors to Nilsen Mfg. Co., Haines City, Fla.

Filed March 2, 1971, Ser. No. 120,209

Int. Cl. G01n *21/26*

U.S. Cl. 250—218 **9 Claims**

A monitor arrangement for controlling liquid flow rate in a line which passes before drop sensing means which sense the passage of drops. Drop trigger means are coupled to and responsive to the drop sensing means and provide an output pulse at the passage of each drop. Triggered by this output pulse are time trigger means which provide a pulse of a predetermined time interval. Logic and comparison means are coupled to said drop and time trigger means to judge the flow rate and motor means are in turn driven by said logic and comparison means. A line valve is responsive to the motor means which regulates the liquid flow in the valve.



3,700,905

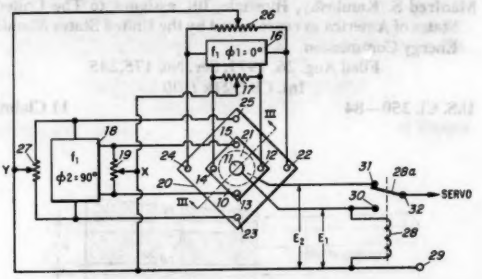
MULTIPLE ELEMENT SENSING APPARATUS

William J. Parkin, Natick, and Joe C. Wilson, Jr., Pepperell, both of Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 4, 1964, Ser. No. 409,355

Int. Cl. G01s *3/78*

U.S. Cl. 250—203 R **15 Claims**



A multiple field optical signal detection apparatus employing a plurality of rotating field detector areas of increasing size, each such area corresponding to an increasing field of view. Each detector area includes a plurality of outer input electrodes and an inner output electrode. A pair of quadrature-phased, alternating current bias signals are applied to corresponding axis-defining pairs of input electrodes. Each output electrode is coupled to a switch which switches from one detector area to another corresponding with its respective field of view. The detector is coupled to a servo system which orients the detector along an axis corresponding with a signal source. The detector areas may be searched with a sweep signal sequentially to provide position signals for a plurality of signals.

3,700,906

MAGNETICALLY CONTROLLED MACHINE PROGRAMMER

Lionel Russell Hickey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

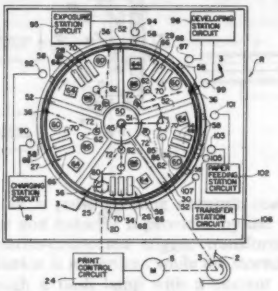
Filed March 16, 1970, Ser. No. 19,644

Int. Cl. H01j *39/12*

U.S. Cl. 250—208 **11 Claims**

A machine programmer is provided for controlling work performed on a work piece which moves through separate

work stations wherein a shift register selectively energizes and deenergizes the work stations in response to movement of the work. The shift register includes a multisectioned cylinder divided into individual light-tight sectors, each having a slot along the periphery of the cylinder through which light can pass, and is rotatably driven by an endless photoconductive member. Each sector has a switching circuit which includes a lamp and a photosensitive device. When it is desired to make electrophotographic copies of an original, the lamp is turned on by an input signal from an electromagnet adjacent the



cylinder which is energized in accordance with the number of copies to be made. As each sector moves along a circular path past the electromagnet, a reed switch is operated to turn on the lamp, whose light by means of a photosensitive device maintains the circuit, and hence the lamp itself, in activated condition. As the cylinder is rotated the light in each lighted sector activates a series of photosensitive devices spaced around the cylinder to energize circuits connected to electrophotographic stations along the path of the photoconductive element in response to movement of the photoconductive element to make copies of the original.

3,700,907

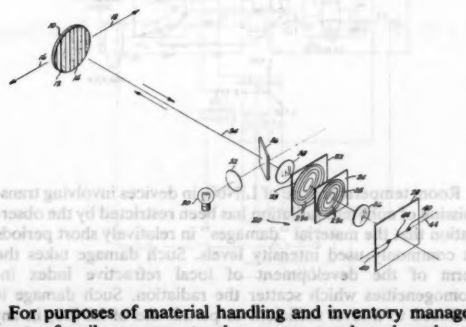
CODE READING SYSTEM FOR IDENTIFICATION OF MOVING AND STATIONARY OBJECTS UTILIZING NONCOHERENT OPTICS

Jon H. Myer, Woodland Hills; Thomas R. O'Meara, and John M. Richardson, both of Malibu, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 770,241, Oct. 24, 1968, abandoned. This application July 20, 1971, Ser. No. 164,373

Int. Cl. G01n *21/30*

U.S. Cl. 250—219 D **10 Claims**



For purposes of material handling and inventory management of railway cars, trucks, crates, packaged and unpackaged goods, and similar objects, markings, comprising a plurality or a composite of coded patterns, on such moving and stationary objects are used for their identification or identification of their contents. To permit such identification, an extended source of spatially incoherent light is modulated by passage through or reflection from the markings to provide input images of the coded patterns. The input images are projected through a pair of plates each having a Fresnel zone thereon for transformation of the input images into output signals corresponding to the optical Fourier transforms of the input images. Since the spatial positions and angular orientations of the output signals are dependent upon the spatial frequencies and orientations of the input images, the coded markings comprise a plurality of distinct patterns of different orientation and spatial frequency which can be correlated to a numerical identification system corresponding to information concerning the objects. The system is designed to operate as close to the geometrical optics limit as is practically feasible.

3,700,908

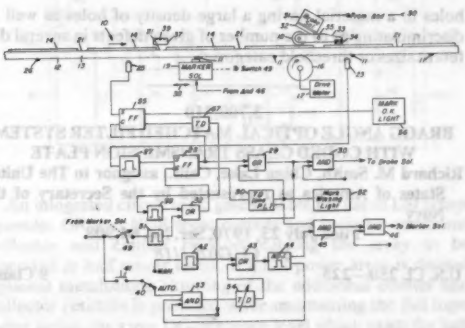
APPARATUS FOR PLACING MARKS ON A WEB

Mark J. Devaney, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 25, 1971, Ser. No. 174,835

Int. Cl. G01n *21/30*

U.S. Cl. 250—219 DR **4 Claims**



An apparatus is disclosed for placing chop-marks on the back of a web of photographic prints to facilitate the automatic chopping of the web into individual prints. The apparatus includes a first photoelectric cell that is located downstream of a marker, and which cell, in cooperation with logic circuitry, is used to so control a web drive means that the web is stopped at particular intervals so that a chop-mark may be placed on the back of each print. The apparatus further includes a second photoelectric cell located upstream of the marker which, in cooperation with the logic circuitry, is adapted to check the web for chop-marks which have previously been placed on the back of some of the prints so that the prints having such pre-existing chop-marks are advanced past the marker without having a second mark placed thereon.

3,700,909

METHOD FOR DETECTING PINHOLE DEFECTS IN FOIL MATERIAL

Russell Murray, Laurel, Md., and Dominique Gignoux, Washington, D.C., assignors to Columbia Research Corporation, Gaithersburg, Md.

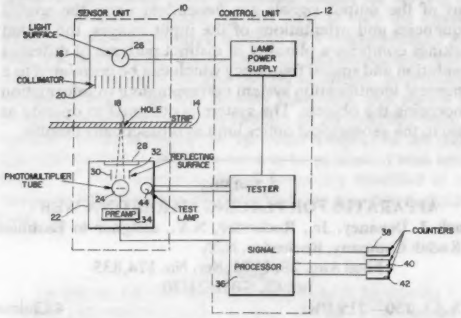
Filed March 9, 1972, Ser. No. 233,239

Int. Cl. G01n *21/32*

U.S. Cl. 250—219 DF **8 Claims**

A system for detecting the number of pinhole defects in any given segment of advancing foil material. Particularly a narrow width ultra-violet light source and corresponding ultraviolet and photomultiplier unit, as well as associated circuitry for shaping and counting electrical pulses, corresponding to

the diameter of the pinhole defects. The system distinguishes from the prior art in that it makes possible the detection of



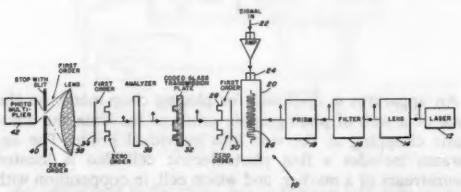
holes in a material having a large density of holes as well as discriminating as to the number of given defects in several different sizes or threshold categories.

3,700,910

BRAGG ANGLE OPTICAL MATCHED FILTER SYSTEM WITH CODED GLASS TRANSMISSION PLATE

Richard M. Smith, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 23, 1970, Ser. No. 64,908
Int. Cl. G02f 1/18
U.S. Cl. 250—225 **9 Claims**



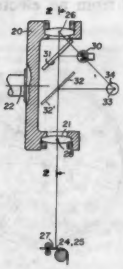
The optical matched filter system provides a means of achieving pulse compression for pulse radar with an improved range resolution. The system separates zero and first order light at low frequencies (30–60MC region) by making use of the polarization properties of shear mode acoustic waves in quartz. Linear polarized collimated zero order light from a laser illuminates an acoustic modulator. An electrical signal is converted by transducers into an acoustic shear wave signal which is propagated through the acoustic modulator and modulates the laser light beam to generate first order light containing a coded phase front polarized orthogonal to the zero order light from the laser containing a plane phase front. When the first order coded phase front and a coded glass transmission plate are matched at the moment of correlation a first order plane phase front is produced. An analyzer blocks most of the zero order light to reduce the bias on a photomultiplier. The first order plane phase front is focused to a spot by a transform lens and the light is passed through an optimized aperture or slit to the photomultiplier where the optical output is converted to an electrical output.

3,700,911

OPTICAL SCANNER WITH STRAIGHT SCANNING LINE

Ernest Wildhaber, 124 Summit Drive, Brighton, N.Y.

Filed April 2, 1971, Ser. No. 130,735
Int. Cl. H01j 3/14
U.S. Cl. 250—236 **10 Claims**



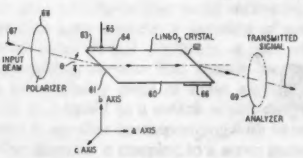
A rotor contains a plurality of lenses spaced about its axis at a constant distance therefrom. As it turns each lens successively forms an image of a narrow area moving along a straight scanning line. The image is formed adjacent a point eccentric of the rotor axis, the eccentricity being computed so that this point remains stationary as the rotor turns. A stationary plane mirror placed inside the lens circle displaces the image to a convenient location. Photocells are placed there. Preferably illumination of said narrow area of the record is through a lens of the rotor from a line-like area of light.

3,700,912

RADIATION-RESISTANT LINBO AND OPTICAL DEVICES UTILIZING SAME

Alastair Malcolm Glass, Millington, and George Earl Peterson, Short Hills, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed May 12, 1971, Ser. No. 142,477
Int. Cl. H03f 7/04; G02f 1/28
U.S. Cl. 307—88.3 **9 Claims**

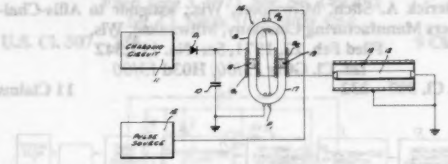


Room temperature use of $LiNbO_3$ in devices involving transmission of coherent radiation has been restricted by the observation that the material "damages" in relatively short periods at commonly used intensity levels. Such damage takes the form of the development of local refractive index inhomogeneities which scatter the radiation. Such damage is reduced to a level sufficient to permit use of $LiNbO_3$ in any such device at room temperature by maintenance of the concentration level of Fe^{2+} impurity at less than 10 ppm and by annealing at temperatures below 700° C. In a preferred embodiment, at least a portion of such said annealing is carried out with the sample under the influence of an imposed electric field.

3,700,913
TRIGGER TRANSFORMER FOR PULSE FORMING NETWORK

Rodney J. Dahlinger, Canoga Park, and Robert P. Farnsworth, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 12, 1970, Ser. No. 63,136
Int. Cl. H01f *3/00*
U.S. Cl. 307—107 **10 Claims**

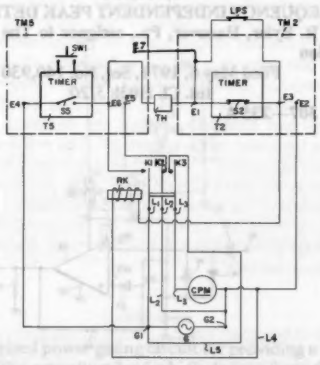


The inductor of a pulse forming network comprising a storage capacitor and inductor is provided by the secondary winding of a series-connected trigger transformer. Electromagnetic radiation is minimized while the stored energy is discharged through a flash lamp with a current waveform determined by the inductance of the secondary winding and the capacitance of the storage capacitor. The waveform is maintained at a desired level determined by the design of the secondary windings on cores of high saturation material. The secondary windings are tightly wound to minimize radiation from the sides of the cores, and the ends of the cores are closed by high permeability, high saturation density material to minimize radiation of the ends of the cores. The cap which prevents saturation of the main transformer core is filled with high permeability, low saturation density material to facilitate use as a trigger transformer.

3,700,914
CONTROL APPARATUS FOR AIR CONDITIONING AND LIKE SYSTEMS

George John Granieri, Piscataway, and Edward Herbert Lefkowitz, Edison, N.J., assignors to The Tappan Company, Mansfield, Ohio

Filed Nov. 20, 1970, Ser. No. 91,446
Int. Cl. H01h *43/00*
U.S. Cl. 307—141 **14 Claims**

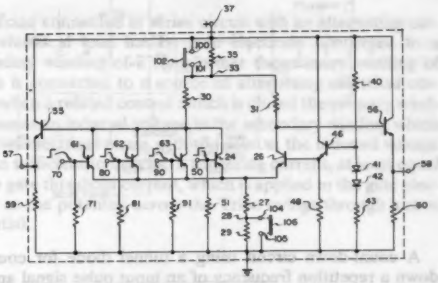


Control equipment for power-operated mechanism, such as an air-conditioning system including circuitry for preventing the operation or re-operation of the compressor or other load until the expiration of a substantial predetermined interval of time after the compressor or load has been released. This equipment will prevent the frequent intermittent operation of the motor of a compressor if, for example, the thermostat or a switch or any other control element were jiggled or moved erratically. This equipment also prevents the operation of the compressor or other load unless, within a second predetermined time interval, the pressure in the supply line feeding fluid to the compressor or load has reached a desired or predetermined pressure. If the predetermined pressure has not been attained, the circuitry will release the compressor motor or load.

3,700,915
FULL-POWER/HALF-POWER LOGIC GATE

Robert R. Marley, San Jose, Calif., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 18, 1971, Ser. No. 107,149
Int. Cl. H03k *19/34*, *19/30*
U.S. Cl. 307—215 **5 Claims**

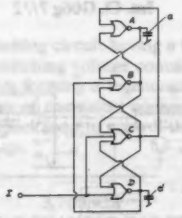


An integrated circuit logic gate suitable for use in LSI arrays provides OR and NOR logic outputs and includes additional collector and emitter resistors causing the array to be operated at half power levels. If a full power array is desired optional metalization shunting of the additional emitter and collector resistors is provided while maintaining the full logic swing across the same DC reference level which exists for half power operation. Thus, full power and half power gates may be interconnected without necessitating the use of additional interface circuits.

3,700,916
LOGICAL FREQUENCY DIVIDER

Eric Andre Vittoz, Neuchatel, Switzerland, assignor to Centre Electronique Horloger SA, Brequet, Neuchatel, Switzerland

Filed Nov. 15, 1971, Ser. No. 198,794
Claims priority, application Switzerland, Nov. 19, 1970, 17138/70
Int. Cl. H03k *19/34*
U.S. Cl. 307—215 **6 Claims**



A logical frequency divider comprising at least one stage of division by two consisting of four logical gates A, B, C and D, the gates being connected as follows: the output from the first gate A controls an input to the second gate B; the output from the second gate B controls an input to the first gate A and an input to the third gate C; the output from the third gate C con-

trols a second input to the first gate A, a second input to the second gate B and an input to the fourth gate D; the output from the fourth gate D controls a third input to the second gate B, a second input to the third gate C. The input signal to the stage of division by two controls a third input to the third gate C and a second input to the fourth gate D.

3,700,917

COUNT-DOWN CIRCUIT USING A TUNNEL DIODE

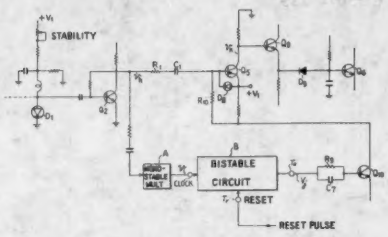
Koji Suzuki, Tokyo, Japan, assignor to Iwassaki Tsushinki Kabushiki Kaisha (also known as Iwatsu Electric Co., Ltd.), Tokyo-to, Japan

Filed May 14, 1971, Ser. No. 143,367

Claims priority, application Japan, May 18, 1970, 45/42312

Int. Cl. H03k *21/00*

U.S. Cl. 307—225 B **3 Claims**



A count-down circuit using a tunnel diode for counting down a repetition frequency of an input pulse signal applied from an input terminal to one electrode of the tunnel diode so as to produce a counted-down output from an output terminal connected to said one electrode of the tunnel diode, in which a series-connection comprising a resistor and a collector-emitter path of a transistor is connected to the output terminal. A bias current is applied through at least a part of the series-connection and the tunnel diode so that an operating point of the tunnel diode is maintained in a low-voltage region. A pulse generator is connected to a path between the input terminal and the tunnel diode for generating a pulse having a repetition period equal to an integer multiple of a repetition period of the input pulse signal in synchronism with the input pulse signal. A bistable circuit is connected to the base of the transistor so as to be set in response to each output pulse of the pulse generator and reset until a just succeeding one of output pulses of the pulse generator.

3,700,918

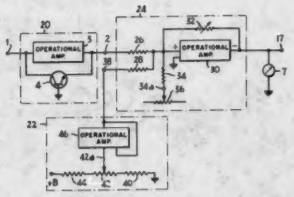
LOGARITHMIC AMPLIFIER

Katsuhiko Kawashima, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed April 13, 1970, Ser. No. 27,820

Int. Cl. G06g *7/12*

U.S. Cl. 307—230 **4 Claims**



A circuit including a semiconductor logarithmic transfer element is connected to an operational amplifier through a resistor having a resistance proportional to its absolute temperature. A comparison voltage dependent upon the transfer element is also applied to the amplifier through another resistor similar in temperature dependency to the first resistor to be substracted from the output from the circuit. The resulting difference is completely temperature compensated and indicated on an indicator having an indication span controlled by a variable resistor connected across the amplifier and a zero point adjusted by a bias to the amplifier.

3,700,919

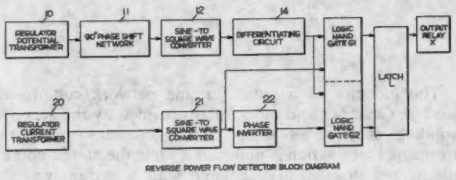
PHASE SHIFT DETECTOR

Frederick A. Stich, Milwaukee, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Feb. 22, 1971, Ser. No. 117,342

Int. Cl. G01r *25/00*; H03d *13/00*

U.S. Cl. 307—232 **11 Claims**



A reverse power flow relay having high load current sensitivity over a wide power factor range receives input signals representative of the voltage on and the current in a power line, shifts the phase of the voltage signal 90°, and has a first high-gain operational amplifier for deriving rectangular positive voltage pulses from the phase-shifted signal, a differentiator for deriving a sharp voltage pulse at the leading edge of each rectangular voltage pulse when the voltage input signal crosses the zero axis, a second high-gain operational amplifier for deriving first rectangular positive current pulses from the current input signal, an inverter for deriving second rectangular positive current pulses shifted 180° in phase from the first rectangular current pulses, a NAND gate logic circuit for providing a first output when the sharp voltage pulses coincide with the first rectangular current pulses, thereby indicating forward power flow, and for providing a second output when the sharp voltage pulses coincide with the second rectangular current pulses, thereby indicating reverse power flow, and a latch circuit operated by the NAND gate logic circuit.

3,700,920

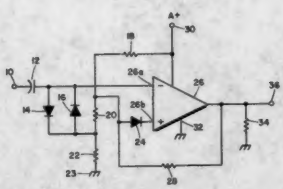
FREQUENCY INDEPENDENT PEAK DETECTOR

Francis R. Eyler, Hanover, Pa., assignor to The Bendix Corporation

Filed May 6, 1971, Ser. No. 140,930

Int. Cl. H03k *5/20*

U.S. Cl. 307—235 A **3 Claims**



A frequency independent peak detector includes a circuit for differentiating the signal whose peak is to be detected, with the output of the differentiating circuit being applied to a high gain amplifier whose output is either in a high or low state, depending on what state the differentiated signal is in. The differentiating circuit is comprised of a capacitor and a diode operating as a resistance which varies inversely proportional

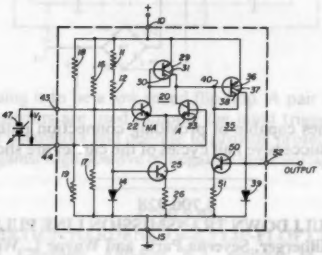
to frequency by virtue of the fact it is biased to operate in the exponential region of its volt-ampere characteristic. This compensates for the change in capacitor reactance as the input signal frequency varies to maintain the frequency-RC time constant product of the circuit relatively constant.

3,700,921

CONTROLLED HYSTERESIS TRIGGER CIRCUIT

Michael J. Gay, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed June 3, 1971, Ser. No. 149,482
Int. Cl. H03k 5/20; H03l 3/68
U.S. Cl. 307—235 9 Claims



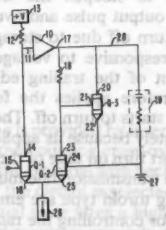
A monolithic integrated trigger circuit has its upper switching threshold determined by different emitter area ratios of a differential amplifier supplied from a first current source, and its lower switching threshold determined by the ratio of the current supplied by the first current source with the ratio of current supplied by a second current source rendered operative by a regenerative switch coupled with the output of the differential amplifier.

3,700,922

FAST ACTING TURN-OFF CIRCUIT

Anatol Furman, Fairfax, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 21, 1970, Ser. No. 73,925
Int. Cl. H03k 17/60
U.S. Cl. 307—246 5 Claims



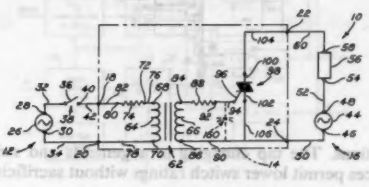
A transistorized power gating circuit for providing a positive pull down of the capacitive load which derives from the load, via a feedback loop, the turn-off drive voltage required to discharge the capacitive load which drive voltage disappears as the load capacitance discharges. The circuit obviates the need of a continuous current flow to initiate the device used in discharging the load capacitance and eliminates the attendent turn-on delays associated with disabling direct coupled pull down circuits.

3,700,923

SOLID STATE RELAY ARRANGEMENT

George E. Platzer, Jr., 30720 Woodgate, Southfield, Mich.

Filed Dec. 22, 1969, Ser. No. 886,864
Int. Cl. H03k 17/00
U.S. Cl. 307—252 B 8 Claims



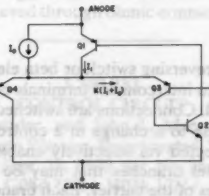
A Triac connected in series circuit with an alternating current electrical load has its gate electrode connected to a secondary winding of a transformer the primary winding of which is connected to a source of alternating electrical current; when a related control switch is closed the primary winding causes an induced voltage in the secondary winding which is out of electrical phase with the source; the induced voltage is then sufficient to develop a triggering current, at least equal to the gate threshold current, which is applied to the gate electrode as the potential across the Triac swings through a zero potential.

3,700,924

DIFFERENTIAL SNAP ACTING SWITCHING CIRCUIT

David E. Fulkerson, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 58,326, July 27, 1970, abandoned. This application Feb. 7, 1972, Ser. No. 223,927
Int. Cl. H03k 17/00
U.S. Cl. 307—255 20 Claims



A snap-acting switching circuit having a temperature independent threshold switching voltage contains a pair of complementary transistors forming a regenerative feedback loop and a differential pair of transistors connected in one of the branches of the feedback loop to control the gain of the loop by a differential voltage.

3,700,925

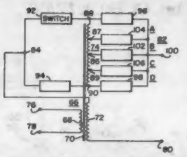
THYRISTOR TAP CHANGER FOR ELECTRICAL INDUCTIVE APPARATUS

Peter Wood, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 29, 1971, Ser. No. 128,728
Int. Cl. H03k 17/00, 17/56
U.S. Cl. 307—252 Q 2 Claims

Tap changing arrangements comprising winding sections

which are bridged by gate controlled switches which interconnect each winding section to aid, oppose or bypass other winding sections. The tap changing arrangements and switching sequences permit lower switch ratings without sacrificing performance.



3,700,926

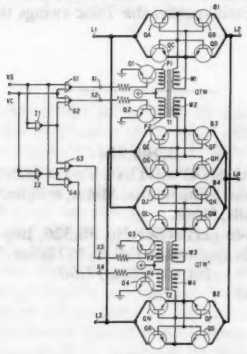
ELECTRONIC BILATERAL BETA ELEMENT SWITCH

James Edwin Dalley, Sherrelwood Estates, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 28, 1971, Ser. No. 147,757

Int. Cl. H03k *17/00*

U.S. Cl. 307—257 **3 Claims**



An electronic reversing switch or beta element is disclosed which functions to interconnect terminals on both half cycles of a carrier signal. Connections are switched between the terminals in response to a change in a control signal. The terminals are connected via selectively enabled bridge circuits containing parallel branches that may be energized on alternate half cycles of the carrier. Each branch includes a serially connected pair of oppositely poled semiconductor devices that exhibit a high impedance between the terminals when off and a low impedance when on for any polarity of external signals. A two-telephone intercom arrangement employing the electronic switches is also disclosed.

3,700,927

ELECTRONIC REVERSING SWITCH

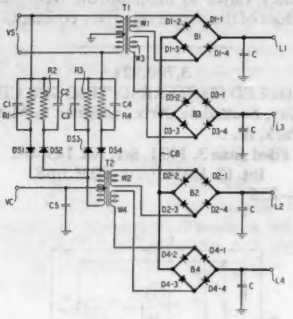
James Edwin Dalley, Sherrelwood Estates, and Nelson Tsin Tsao-Wu, Boulder City, both of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 28, 1971, Ser. No. 147,758

Int. Cl. H03k *17/00*

U.S. Cl. 307—257 **10 Claims**

A reversing switch which changes connection paths for external circuits in response to a change in polarity of a control signal is disclosed. The control signal alters the phase in which a carrier signal is applied to select different sets of diode bridges that provide the connection paths for the external circuits. Switches capable of providing connection paths on alternate and successive half cycles of the carrier are shown.



3,700,928

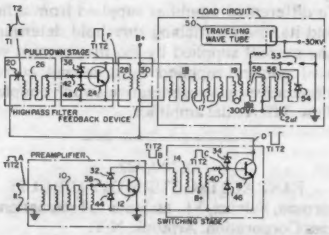
FAST PULLDOWN TRANSMISSION LINE PULSER

Walter E. Milberger, Severna Park, and Wayne L. Weigle, Ellicott City, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 30, 1969, Ser. No. 846,154

Int. Cl. H03k *5/00*

U.S. Cl. 307—268 **12 Claims**



A switching transistor is used to pulse a high voltage radar transmission tube on and off. Each time the switching transistor turns off, positive feedback is applied thereto by a pulldown transistor to steepen the trailing edge of the switching transistor output pulse and overcome the inherent delay in transistor turn off due to storage effects. The pulldown transistor is responsive to voltages generated by the transient component of the trailing edge of the switching transistor, and therefore applies the feedback just as the switching transistor starts to turn off. The pulldown feedback is effective immediately because its application is limited only by the relatively short turn on time of the pulldown transistor. Transformers of the transmission line multifilar toroid type or of the loop coupling toroid type are employed to generate a high voltage pulse for controlling the radar transmission tube at its grid or cathode.

3,700,929

INTEGRATED BISTABLE CIRCUIT

Thomas M. Frederiksen, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

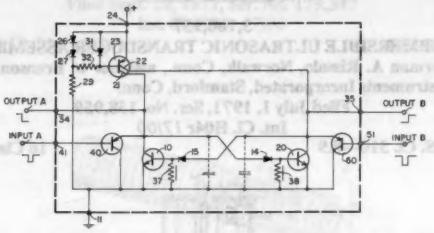
Continuation of Ser. No. 116,566, Feb. 18, 1971, abandoned. This application Jan. 10, 1972, Ser. No. 216,756

Int. Cl. H03k *3/28 6*

U.S. Cl. 307—291 **11 Claims**

A protected monolithic integrated flip-flop circuit comprises a pair of NPN transistors as the active flip-flop elements

with the collectors of each of these transistors being supplied from a constant current source in the form of a dual-collector lateral PNP transistor. Collector-to-substrate distributed capacitance operates to retard the switching time of the flip-



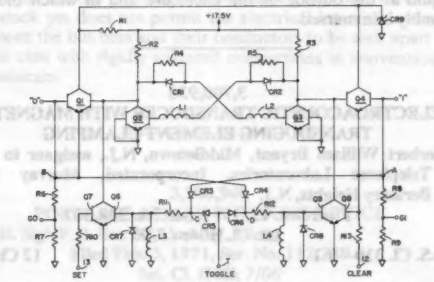
flop causing it to be a low speed flip-flop. A pair of substrate PNP transistors are used to apply the input trigger signals to the NPN transistors and operate to provide protection for the circuit against high positive or negative input voltages.

3,700,930

RADIATION HARDENED R-L FLIP-FLOP CIRCUIT

Xavier F. Gonzalez, Andover, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed April 23, 1971, Ser. No. 136,691
Int. Cl. H03k *3/28 6*
U.S. Cl. 307—292 **1 Claim**



Radiation hardening is provided by inserting inductors in series with resistors in the coupling cross-over paths of the flip-flop and by shunting the resistors with back connected diodes. The time constant of the circuit is selected such that the flip-flop returns to its initial state after a high radiation level has subsided due to stored energy in one inductor.

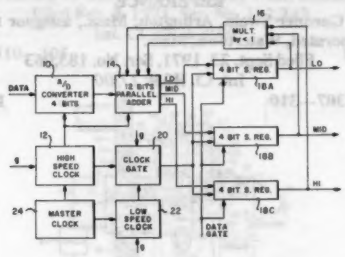
3,700,931

SHIFT REGISTER CLOCKING AT HIGH SPEEDS WHERE PARALLEL OPERATION IS NEEDED

Phillip L. Watkins, Rockville, Md., and Raymond W. Cox, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy

Filed Nov. 24, 1971, Ser. No. 201,787
Int. Cl. H03k *3/04*
U.S. Cl. 328—63 **3 Claims**

A system for clocking a plurality of shift registers in parallel at shift rates up to 10 MHz which employs a single high speed master clock to provide a signal to individual clock drivers. Thus improving the isolation of the master clock and provid-



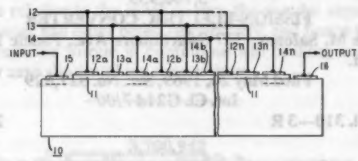
ing a two phase clock needed to drive the individual shift registers. The shift registers to be driven and the driving circuits being mounted in close proximity to each other.

3,700,932

CHARGE COUPLED DEVICES

Dawon Kahng, Bridgewater Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 18, 1970, Ser. No. 47,205
Int. Cl. G11c *19/00, 13/00*
U.S. Cl. 307—304 **8 Claims**



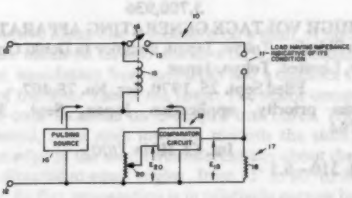
The specification describes a charge coupled device for information storage and processing in the form of discrete charge bundles. The device is characterized in that the storage medium is a semi-insulating material such as ZnO or ZnS. The carriers representing the information can normally be introduced and retrieved through ohmic contacts.

3,700,933

CONTROL CIRCUIT

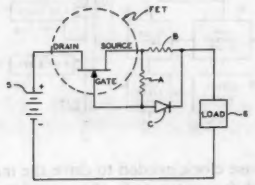
Robert J. Harkenrider, and John L. Moe, both of Winona, Minn., assignors to Waynco, Incorporated, Winona, Minn.

Filed Sept. 28, 1970, Ser. No. 76,000
Int. Cl. G05d *23/24*; **H03k** *17/14, 17/66*
U.S. Cl. 307—310 **18 Claims**



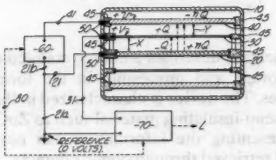
An electrical circuit is provided wherein pulsed energy samples are applied to a load at spaced intervals and monitored to determine the condition of the load and any changes in pulse energy through the load are compared to a reference and used to initiate control action.

3,700,934
TEMPERATURE-COMPENSATED CURRENT REFERENCE
Charles Gardner Swain, Arlington, Mass., assignor to Ionics, Incorporated, Watertown, Mass.
Filed Sept. 23, 1971, Ser. No. 183,063
Int. Cl. H03k 17/00
U.S. Cl. 307—310 10 Claims



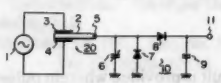
Electrical circuits are described that can be connected in series with a voltage source and a load in the same manner as a field-effect current-regulator diode to supply the load with a constant current having a temperature coefficient below 0.01%/°C. from 0° to 60° C. at current levels as low as 10 microamperes and having a voltage coefficient below 0.1%/volt from 5 to 12 volts. Very precise temperature compensation can be achieved at the desired current by adjustment of two resistors in these circuits.

3,700,935
FISSION-ELECTRIC CONVERTER
George M. Safonov, 327 Swarthmore Ave., Pacific Palisades, Calif.
Filed May 26, 1969, Ser. No. 827,829
Int. Cl. G21d 7/00
U.S. Cl. 310—3 R 24 Claims



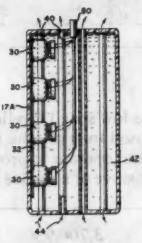
Electric generator apparatus for producing useful electric energy through direct conversion of kinetic energy of positively charged atomic fragments produced by nuclear fission by utilizing a fragment collecting electrode selectively permeable as respects the negatively charged electrons. These electrons are decelerated and collected by a collector electrode and returned through a suitable electrode to the source electrode.

3,700,936
HIGH VOLTAGE GENERATING APPARATUS
Massao Shimizu, Tokyo, Japan, assignor to Denki Onkyo Company, Limited, Tokyo, Japan
Filed Sept. 25, 1970, Ser. No. 75,407
Claims priority, application Japan, Sept. 30, 1969, 44/92794
Int. Cl. H01v 7/00
U.S. Cl. 310—8.1 2 Claims



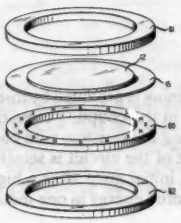
In a high voltage generating apparatus utilizing a piezoelectric transformer element driven by an AC voltage, the resonance frequency of the piezoelectric transducer element is varied by connecting a variable capacitor of small capacity between the output electrode of the piezoelectric transformer element and the ground.

3,700,937
SUBMERSIBLE ULTRASONIC TRANSDUCER ASSEMBLY
Herman A. Rissolo, Norwalk, Conn., assignor to Branson Instruments Incorporated, Stamford, Conn.
Filed July 1, 1971, Ser. No. 158,959
Int. Cl. H04r 17/00
U.S. Cl. 310—8.9 16 Claims



An ultrasonic processing apparatus includes an ultrasonic transducer assembly comprising a submersible enclosure made of material having a low thermal conductivity. Electroacoustic transducers are coupled to an interior surface of the enclosure which is filled with a heat conductive liquid. The interior of the enclosure is traversed by tubes which establish heat transfer between the interior of the enclosure and the liquid at the outside of the enclosure and in which the assembly is immersed.

3,700,938
ELECTROACOUSTIC TRANSDUCER WITH MAGNETIC TRANSDUCING ELEMENT CLAMPING
Herbert William Bryant, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Dec. 15, 1971, Ser. No. 208,307
Int. Cl. H04r 17/00
U.S. Cl. 310—9.1 12 Claims

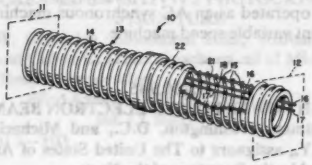


An electromechanical transducing element is bonded to a magnetic plate, and the composite structure is clamped within a transducer housing by means of one or more magnets attached thereto or embedded therein. The magnets serve to semirigidly clamp the plate to the housing, obviating the need for cement or other rigid clamping means, thereby reducing undesirable high or non-uniform stresses in the plate and allowing radial expansion and contraction of the plate due to thermal variations without damage to the transducer or alteration of its performance.

3,700,939
FERROELECTRIC CERAMIC STACK

Frank R. Abbott, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Sept. 10, 1971, Ser. No. 179,347
Int. Cl. H04r 17/00
U.S. Cl. 310—9.8 4 Claims

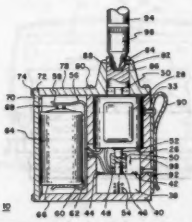


A unique coupling arrangement for joining the thin leaf conductors interposed between adjacent ones of a stack of ferroelectric elements functioning as an acoustic energy projecting transducer is provided. A separate resilient helical spring element is secured to each metalic conductor and has an orthogonally shaped portion to slidably contact one of two longitudinally extending bus bars sized to reach through the orthogonal portions. By coupling alternate ones of the helical springs to one of the bus bars and the other alternate ones of the helical springs to the other bus bar, the ferroelectric rings are connected electrically in parallel to provide an additive composite driving force for the transducer when a suitable driving field is impressed across the stack. Having the resilient, orthogonally shaped helical springs mounted in slidable contact with the bus bars allows responsive reciprocal travel by the stack yet does not permit the electrical interconnections between the bus bars and their conductors to be torn apart as is the case with rigidly soldered connections in conventional transducers.

3,700,940
PORTABLE ARROW CHECKING DEVICE

Jon D. Sigl, P.O. Box 22, Conway, Mich.

Filed Feb. 3, 1971, Ser. No. 112,249
Int. Cl. H02k 7/00
U.S. Cl. 310—66 4 Claims

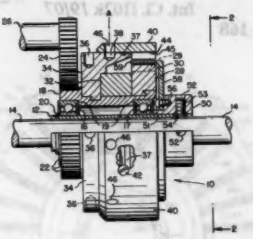


A portable device for checking the straightness of an archery arrow which comprises a housing, an electric motor and an arrangement for selectively energizing the motor in the housing. The motor has an output shaft to which is coupled means for engaging the head of an archery arrow, whereby the arrow can be rotated rapidly about its axis and any warp in the arrow observed.

3,700,941
ADJUSTABLE HYSTERESIS CLUTCH AND BRAKE

John E. Duncan, 70 Gardenville Parkway West, Buffalo, N.Y.

Filed Feb. 3, 1971, Ser. No. 112,243
Int. Cl. H02k 49/02
U.S. Cl. 310—105 8 Claims



This hysteresis type magnetic device has a permanent magnet secured between two magnetizable pole members on a sleeve which is rotatably mounted on the output shaft coaxially thereof. One pole member is disposed within the other and has a plurality of axially extending external teeth or poles which confront but are radially spaced from a like plurality of internal teeth or poles on the outer pole member. A magnetizable, cup-shaped rotor is secured to the output shaft and has its annular wall projecting into the radial space between the inner and outer poles. The outer pole member is angularly adjustable relative to the inner to vary the angular separation between inner and outer poles, respectively, and hence to vary the transmittable torque in continuous slip braking and continuous or zero slip clutching connections.

3,700,942
SELF-STARTING SYNCHRONOUS MOTORS

Max Alth, 6 Tamarack Road, Port Chester, N.Y.

Filed Feb. 3, 1971, Ser. No. 112,206
Int. Cl. H02k 21/00
U.S. Cl. 310—164 6 Claims

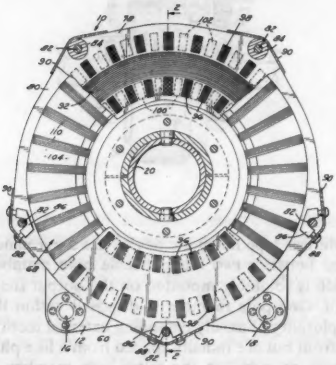
A conductive metal disc is mounted on a shaft. A number of magnets are mounted on said disc in a cicle, equidistant from each other, equidistant from said shaft and a distance in from the edge of the disc. This is the rotor. The stator comprises a number of coils mounted on U-shaped iron cores. The cores are positioned, open ends inwards, towards the shaft, overlapping the edge of the disc, circumferentially about the rotor. Cores are directed at equal angles , from 15° to 90° to the radii of the disc. As flux propagation is in relatively narrow bands at an angle other than radial to the shaft, the conductor is repulsed and turns. Synchronization occurs at a speed related to number of driving poles and rotating fields.

Alternately, PMs may be replaced by coils powered by DC taken from slips rings; by induced AC power converted to DC by rectifiers connected to the coils and mounted on the rotor, and by shorted turns on said rotating poles.

3,700,943
DISC-TYPE VARIABLE RELUCTANCE ROTATING MACHINE

Walter K. Heintz, Westland, and Lewis E. Unnewehr, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 8, 1971, Ser. No. 196,615
Int. Cl. H02k *19/07*
U.S. Cl. 310—168 **11 Claims**

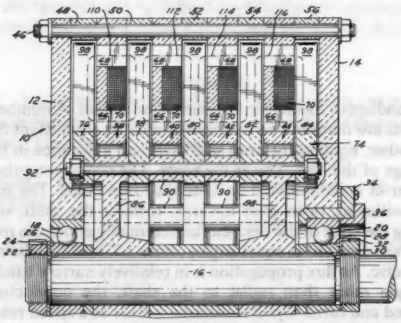


Described is a novel design for a disc-type variable reluctance rotating machine. The rotating machine, preferably used as a motor, is brushless and in the preferred form comprises a plurality of stator sections supported by a frame. A shaft is rotatably journaled in the frame structure and the stator sections are separated from one another by a plurality of rotor assemblies attached to the shaft for rotation therewith. The stator sections each have a helically wound coil surrounding the shaft and a plurality of inner and outer inserts made from magnetic material. The rotor assemblies also have inserts made from magnetic material to form a flux path around the stator coils. The rotating machine of the invention may be operated as an AC synchronous machine or as a pulsed current variable speed machine.

3,700,944
DISC-TYPE VARIABLE RELUCTANCE ROTATING MACHINE

Walter K. Heintz, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 8, 1971, Ser. No. 196,614
Int. Cl. H02k *19/02*
U.S. Cl. 310—168 **9 Claims**

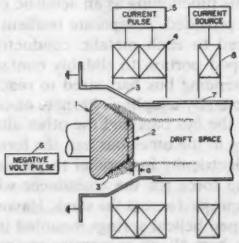


Described is a novel design for a disc-type variable reluctance rotating machine. The rotating machine, preferably used as a motor, is brushless and in the preferred form comprises a plurality of stator discs that are supported by a frame including a pair of spaced and parallel end plates. A shaft is rotatably journaled in the end plates and the stator discs are separated from one another by a plurality of rotor discs attached to the shaft for rotation therewith. The stator discs each have an annular channel in which a helically wound winding is positioned. Each of the stator discs also includes a plurality of equally spaced inner and outer inserts made from a magnetic material. The rotor discs also have inserts made from magnetic material to form a flux path around the winding in each of the stator discs. The rotating machine of the invention may be operated as an AC synchronous machine or as a pulsed-current variable speed machine.

3,700,945
HIGH POWER PULSED ELECTRON BEAM

Mushe Friedman, Washington, D.C., and Michael G. Ury, Ithaca, N.Y., assignors to The United States of America as represented by the Secretary of the Navy

Filed Aug. 30, 1971, Ser. No. 175,888
Int. Cl. H01j *29/46*
U.S. Cl. 313—84 **5 Claims**

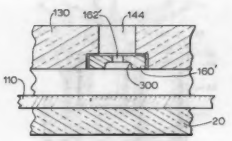


Apparatus for generating a relativistic annular electron beam with a power in the 10^{10} watt range utilizing a solid conical cathode of blunted shape and a surrounding truncated anode. A high intensity, pulsed magnetic field guides and focuses the electrons emitted from roughened areas of the cathode by a cold field emission process to form the annular beam.

3,700,946
GASEOUS DISPLAY PANEL WITH APERTURED, METALLIC STRIP-LIKE, SCANNING CATHODES

Bernard Caras, Princeton, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 20, 1971, Ser. No. 173,373
Int. Cl. H01j *61/08*, *61/30*
U.S. Cl. 313—188 **3 Claims**



A gas-filled display panel includes a top plate, a bottom plate, an apertured center plate, and a plurality of arrays of electrodes associated therewith. The bottom plate is provided with slots for receiving an array of scanning anode electrodes; an array of scanning cathode electrodes is disposed between the bottom plate and the center plate, and an array of display anode electrodes is disposed between the center plate and the top plate. The electrodes and plates are interrelated to provide upper and lower layers of gas-filled cells. The cathode electrodes comprise metal strips which are elongated and have an

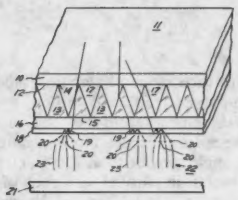
array of apertures disposed along their lengths, each aperture providing communication between a cell in the lower layer and a cell in the upper layer. The cathode strips are of sufficient thickness to provide strength and rigidity except for a thinner central portion which extends along, and is aligned with, the array of apertures therein whereby the apertures are of minimum depth.

3,700,947

INCREASED SENSITIVITY PHOTOCATHODE STRUCTURE

George W. Goodrich, Bloomfield Hills; William B. Colson, Troy, and Calvin C. Matle, Dearborn, all of Mich., assignors to The Bendix Corporation

Filed April 8, 1971, Ser. No. 132,372
Int. Cl. H01j *43/00*
U.S. Cl. 313—103 **11 Claims**



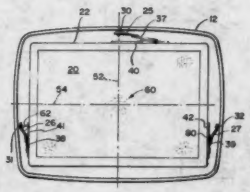
A photocathode substrate includes a plurality of prisms to refract radiation before it impinges upon a photocathode material. The refraction causes most of the radiation to meet the photocathode material at an angle other than 90° so that internal reflection of the energy within the photocathode material occurs. This greatly enhances the probability of electrons being released from the photocathode material.

3,700,948

EDGE-BONDED BI-METALLIC STRIP EXTENDING FROM METAL PLATE ON SHADOW MASK TO STUD VIA SPRING OF SUBSTANTIALLY SMALLER CROSS-SECTIONAL AREA THAN STRIP

Kazimir Palac, Carpentersville, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed July 9, 1970, Ser. No. 53,485
Int. Cl. H01j *29/06, 29/08, 29/02*
U.S. Cl. 313—85 S **4 Claims**



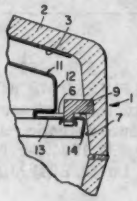
A three point support for a shadow mask screen within the faceplate panel of a color cathode ray tube is provided by three studs embedded in the glass side walls of the panel and spring mounting members which are connected to the studs and to edge bonded bimetallic strips which in turn are connected to the shadow mask. The springs and bimetallic strips are of dissimilar metals, and each spring has a cross-sectional area substantially less than the cross-sectional area of each bimetallic strip thereby thermally insulating the bimetallic strip from the stud of the faceplate panel.

3,700,949

COLOR TELEVISION PICTURE TUBE

Takeshi Watanabe, and Yuzi Saito, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1971, Ser. No. 108,366
Int. Cl. H01j *29/46, 29/56*
U.S. Cl. 313—85 S **4 Claims**



A color television picture tube comprises an integrally formed shadow mask unit including electron beam passing apertures, and skirt, and flange portions. The unitary mask construction is secured to a bulb housing via studs, and bimetal is employed for temperature compensation.

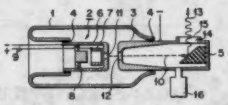
The structure obviates welding and welding associated nonuniformity and expense, and also permits accurate registration of the mask structure within the tube.

3,700,950

X-RAY TUBE

Terasawa Michitaka, Yokohama, Japan, assignor to Tokyo-Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed May 5, 1971, Ser. No. 140,481
Claims priority, application Japan, May 8, 1970, 45/38908
Int. Cl. H01j *35/08*
U.S. Cl. 313—55 **5 Claims**



An X-ray tube whose vacuum vessel contains a target made of electrical insulation material, a source of charged particles and an electrode for accelerating charged particles emitted from said source wherein the target is impacted by a beam of charged particles thus accelerated so as to produce soft X-rays of particularly great intensity.

3,700,951

DISCHARGE LAMPS HAVING IMPROVED THERMIONIC CATHODES

Maurice George Clarke, and Norman Burgess, both of London, England, assignors to Thorn Lighting Limited, London, England

Filed Feb. 9, 1971, Ser. No. 113,934
Claims priority, application Great Britain, Feb. 11, 1970, 6,662/70
Int. Cl. H01j *1/14, 19/06*
U.S. Cl. 313—346 R **3 Claims**

A thermionic cathode for discharge lamps is a two part structure consisting of a wire stem bearing a cup at its end, the

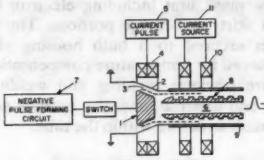
cup being a receptacle for an electron-emitting composition and ensuring that electrons can only issue from the mouth of the cup and not by passage through the side of the cup. In one form, a foil is rolled around the end region of the stem, the rolled foil projecting beyond the end of the stem and thereby forming the cup. Instead of foil, a welded-coil may be used in a similar way to define the cup.

3,700,952

HIGH POWER PULSED MICROWAVE SOURCE

John A. Nation, Ithica, N.Y., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 30, 1971, Ser. No. 175,887
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.5 **5 Claims**



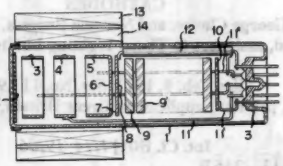
Microwave pulses at power levels in excess of 10 megawatts and of short duration and narrow bandwidth are produced by propagating an annular relativistic electron beam carrying currents of 30–40 kA at energies of 200–500 keV through a cylindrical, symmetrical annular, ridged wave guide. The interaction between this beam and a backward wave in the guide leads to the oscillations.

3,700,953

IMAGE DISSECTOR TUBE

Yoshiji Suzuki, Shizuoka; Ikuo Hayashi, Hamamatsu; Kazuo Kurasawa, Hamamatsu, and Mitsuhiro Shimada, Hamamatsu, all of Japan, assignors to Hamamatsu TV Company Limited, Prefecture, Japan

Filed April 28, 1969, Ser. No. 819,889
Claims priority, application Japan, April 30, 1968, 43/34840
Int. Cl. H01j *31/48*
U.S. Cl. 315—11 **1 Claim**



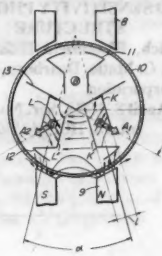
The present disclosure is directed to an image dissector tube having an image forming and scanning section and an electron multiplier section in which a control electrode is provided between said sections so as to apply a blanking voltage synchronously with a retrace period to cut off the beam and thereby present a black background level during the retrace period of the signal produced by the image dissector tube.

3,700,954

COLOR PICTURE TUBE DEVICE

Susumu Egawa, Osaka; Shigeya Ashizaki, Takatsuki-shi; Katsumi Shimizu, Ibaragi-shi, and Tosihiko Miyati, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 19, 1970, Ser. No. 3,899
Int. Cl. H01j *29/50*
U.S. Cl. 315—13 C **5 Claims**



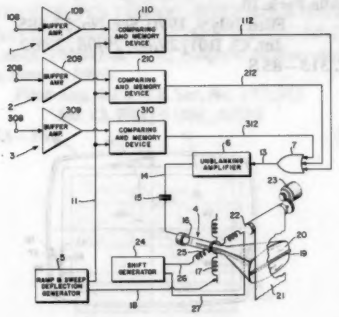
A color picture tube device having a "blue" convergence pole piece and a pair of "red" and "green" convergence pole pieces provided therein, wherein the "red" and "green" convergence pole pieces are disposed in opposing relationship to each other at an angle smaller than 120°C, electrodes are provided such that each is in parallel with each of the pair of pole pieces respectively, "red" and "green" beams being made to pass between the electrodes and the pair of pole pieces so that three, "red", "blue" and "green", beams may be moved on the screen with an angle of 120° being maintained therebetween.

3,700,955

CATHODE RAY TUBE DISPLAY APPARATUS WITH EXTENDED TUBE LIFE

Peter R. Lowe, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 1, 1970, Ser. No. 68,626
Int. Cl. H01j *29/72*
U.S. Cl. 315—20 **3 Claims**

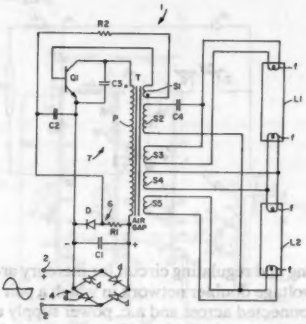


The beam of a line scan fiber optics cathode ray tube is repeatedly swept along the phosphor element of the tube by a horizontal deflection coil to provide traces, representing the values of a plurality of data signals, which are recorded on a record sheet drawn continuously over the face of the fiber optics strip of the tube. A vertical shift deflection coil, energized by the trianglular wave output signal of a shift deflection generator, slowly and continuously shifts the path, along which the beam sweeps on the phosphor, up and down between the boundaries of the area of the phosphor which is coextensive with the active area of the fiber optics strip.

3,700,956
ARC DISCHARGE LAMP CONTROL CIRCUIT

Ronald D. Cluett, Gloucester, Mass., assignor to GTE Laboratories Incorporated

Filed Jan. 4, 1971, Ser. No. 103,582
Int. Cl. H05b *41/29*
U.S. Cl. 315—101 5 Claims



A high-frequency, lightweight, solid-state ac ballast for operating arc discharge lamps such as fluorescent lamps. An ac ballast in accordance with the invention includes a single transistor and a storage capacitor interconnected with a lightweight air-gap ferrite core transformer provide a blocking oscillator circuit capable of high-frequency ac operation. To initiate operation of the blocking oscillator circuit, low-frequency (e.g., 50-60 hertz) ac input voltage signals are converted to a dc voltage and applied to a starting circuit for producing a voltage for charging the storage capacitor. When the voltage developed across the capacitor reaches a predetermined value, the transistor is forward biased into conduction thereby initiating operation of the blocking oscillator circuit. After a predetermined period of time, the transistor is reversed biased by a voltage produced across a regenerative feedback winding of the air-gap transformer thereby terminating operation of the blocking oscillator circuit. During the operation of the blocking oscillator circuit through several cycles, high-frequency ac voltage signals (e.g., 20 kilohertz) are produced across a load winding of the air-gap transformer for operating a pair of fluorescent lamps.

A modified version of the abovedescribed ac ballast includes a square hysteresis loop ferrite toroid in the blocking oscillator circuit, in addition to the air-gap transformer, for causing the transistor to switch more quickly between its conducting and non-conducting states.

3,700,957
FLAME RETARDANT POLYESTER PLASTICIZER CONTAINING 2,2-DIBROMOMETHYLENE-1,3-PROPANEDIOL

David A. Daniels, Kendall Park, N.J., assignor to W. R. Grace & Co., New York, N.Y.

Filed Jan. 13, 1971, Ser. No. 106,258
Int. Cl. C08f *45/38*; C08g *17/06*; C07c *69/34*
U.S. Cl. 260—31.6 6 Claims

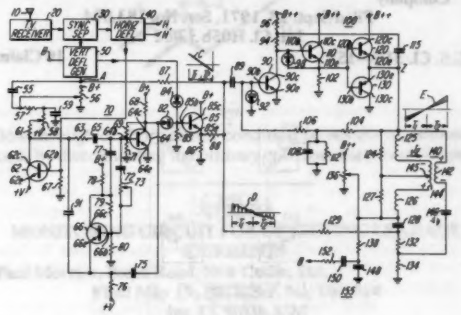
Disclosed herein are novel compositions of matter having both flame-retarding and plasticizing properties and have the following mole percent compositions:

dicarboxylic acids	20 to 50
glycol	5 to 25
) 2,2-dibromomethyl-1,3 propanediol	5 to 25
terminating agent	0 to 40
alkyl phosphite	0 to 10

3,700,958
DEFLECTION AND PINCUSHION CORRECTION CIRCUIT

Peter Eduard Haferl, Adliswil, Switzerland, assignor to RCA Corporation

Filed March 5, 1971, Ser. No. 121,370
Int. Cl. H01j *29/70*
U.S. Cl. 315—24 10 Claims

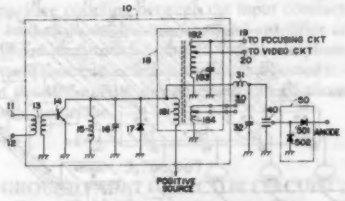


Combined vertical deflection and top and bottom pincushion correction signals are applied to a single amplifier circuit which provides the required vertical deflection n output current as well as pincushion correction signals for a television receiver. Since the frequency of the vertical deflection and pincushion correction signals are substantially different, a series resonant circuit tuned to the horizontal deflection frequency is employed at the output of the amplifier to apply the pincushion signal to the vertical deflection yoke. The resonant circuit includes an inductor which is the primary winding of a transformer whose secondary winding is coupled in series with the vertical deflection yoke to inject the pincushion correction information into the vertical deflection yoke. Negative feedback is employed in the amplifier to preserve the parabolic waveform of the applied pincushion correction signal.

3,700,959
HORIZONTAL DEFLECTION CIRCUITS FOR TELEVISION RECEIVERS

Yasunobu Sakurai, Kawasaki, Japan, assignor to Denki Onkyo Company, Limited, Tokyo, Japan

Filed Sept. 23, 1970, Ser. No. 74,550
Claims priority, application Japan, Sept. 30, 1969, 44/92793
Int. Cl. H01j *29/70*
U.S. Cl. 315—29 4 Claims



In a television receiver comprising a high voltage generating apparatus including a piezoelectric transducer, a pulse transformer having a primary winding responsive to the deflection current and a secondary winding and means to energize the piezoelectric transducer by a pulse voltage supplied to the primary winding at the time of blanking, there is provided a horizontal deflection circuit comprising a parallel resonance circuit comprised by the secondary winding of the pulse trans-

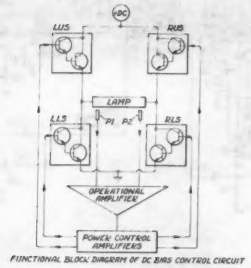
former and a capacitor for producing a third harmonic voltage wave of the blanking frequency of the horizontal oscillation signal, said third harmonic voltage wave acting to decrease the peak value of the pulse voltage.

3,700,960

METAL HALIDE LAMP SYSTEM

William H. Lake, Novelty, Ohio, assignor to General Electric Company

Filed Sept. 23, 1971, Ser. No. 183,094
Int. Cl. H05b *37/02*
U.S. Cl. 315—151 **10 Claims**



FUNCTIONAL BLOCK DIAGRAM OF DC BIAS CONTROL CIRCUIT

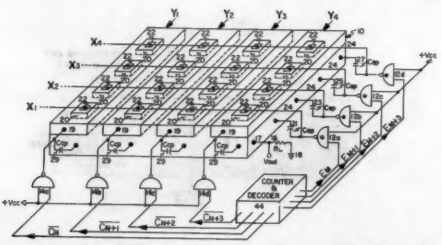
A major difficulty with long linear metal halide type lamps is nonuniformity of light output along the axis of the lamp. The extent of nonuniformity increases with the number of metals included in the lamp filling and the factors primarily responsible for it are cataphoresis and thermal gradients. The cataphoretic effect is the stronger and the nonuniformity may be overcome by supplying a DC component to the discharge current and controlling its polarity and magnitude. In one system, the lamp is operated from a DC power supply through a control circuit using semi-conductors for polarity reversing switches wherein the time of current flow in one polarity is determined by the direction and degree of unbalance of the spectral output.

3,700,961

PHOTOTRANSISTOR IMAGING SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; William F. List, 521 Greenwood Road, Linthicum, Md., and David L. Farnsworth, 13005 Old Stagecoach Road, Apt. 1516, Laurel, Md.

Filed Aug. 19, 1971, Ser. No. 173,185
Int. Cl. H05b *37/00*; H02b *1/04*
U.S. Cl. 315—169 TV **7 Claims**



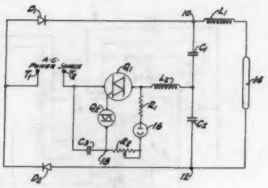
A phototransistor Imaging system employing a mosaic of phototransistors formed on a semiconductor substrate and operated in a charge-storage mode and in which a charge-storage effect occurring between the substrate and an electrical conductor interconnecting emitters of the phototransistors is used to provide a system output across a load circuit connected between the substrate and a system ground.

3,700,962

CONTROL CIRCUIT FOR MERCURY ARC LAMPS

Robert D. Munson, Jennings, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 4, 1970, Ser. No. 86,720
Int. Cl. H05b *37/00*
U.S. Cl. 315—241 **13 Claims**



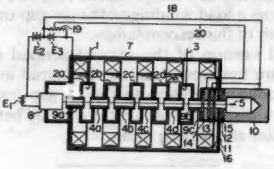
A starting and regulating circuit for mercury arc lamps comprising a voltage doubler network in which a pair of capacitors parallel connected across and a.c. power supply are alternately charged during alternate half cycles through signal controlled solid stage switching and rectifying means to provide a starting potential for the lamp, are then alternately discharged through the lamp and a series inductor and alternately act to limit current flow through the lamp; in which conduction of the switching means is delayed each half cycle until supply voltage has substantially increased; and in which conduction of the switching means is variably delayed in accordance with variations in an operating condition of the lamp to maintain a predetermined operating condition.

3,700,963

MICROWAVE TUBE ASSEMBLY

Takashi Shimada, Tokyo, Japan, assignor to Tokyo Shibaura Electric, Ltd., Kawasaki-shi, Japan

Filed July 13, 1971, Ser. No. 162,206
Claims priority, application Japan, July 16, 1970, 45/61766; Oct. 6, 1970, 45/98807
Int. Cl. H01j *23/02*
U.S. Cl. 315—5.38 **6 Claims**



A microwave tube assembly comprising a main collector for trapping electrons passing through the microwave outlet of the high frequency section of a microwave tube where incoming microwaves and the electrons act on each other; a plurality of subcollectors disposed between the microwave outlet and the main collector; and a magnetic shield plate for shutting off a magnetic field acting in the axial direction of the microwave tube wherein said plural subcollectors consist of at least first and second units; at least part of the first subcollector is disposed on the side of the main collector and the second subcollector is placed on that side which faces the microwave outlet; the second subcollector and main collector are maintained at a substantially equal voltage; the first subcollector is held at a higher voltage than the second subcollector; and the magnetic shield plate is disposed in the region where said first subcollector which faces the main collector is arranged.

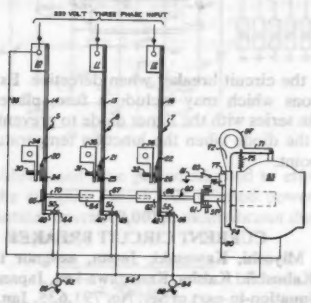
3,700,964
MOTOR OVERLOAD PROTECTOR AND VOLTAGE CUT-OUT DEVICE

Thomas Moore, 7235 Leavitt Road, Elyria, Ohio

Continuation-in-part of Ser. No. 773,923, Nov. 6, 1968, Pat. No. 3,530,377. This application Sept. 22, 1970, Ser. No. 74,277

Int. Cl. H02h *5/04, 7/08*

U.S. Cl. 317—13 C 15 Claims



A current responsive motor overload protector for a three-phase AC motor wherein there are three bimetallic elements each of which is incorporated in a switch, each such switch being in series with a phase lead of a three-phase AC voltage source and also with a motor lead. Each of the bimetallic elements normally maintaining its respective switch in a closed position and opening automatically or bending towards an open condition due to the heating effects of a current passing through it when the motor is in an overload condition. A further circuit is included in the protector which is responsive to the opening, or bending, of each bimetallic element switch and when one of a bimetallic element switch opens at least in part, it energizes the further circuit which actuates a solenoid which, in turn, simultaneously causes each of the bimetallic element switches to open in a quick acting movement. A movable biased toggle mechanically secures the solenoid so that the bimetallic strip switches are retained in the open position until the toggle is manually reset. The toggle also opens a switch in a further circuit which serves to secure the current to the solenoid. An indicia means such as a lamp, buzzer or bell, or combination thereof, is connected between one of the electrical phase sources on one side and to a ground or a motor-phase lead via contacts which are closed responsive to the opening of each metallic switch on the other side. Warning indicia may be provided which is energized by a contact with each bimetallic element prior to the opening thereof when the overload condition of the metallic element is not sufficient to energize the further circuit.

3,700,965
TRANSFORMER SHORTING DEVICE

Kunio Tone, Tokyo, Japan, assignor to Tokyo Keideniki Kabushiki Kaisha, Ota-ku, Tokyo, Japan

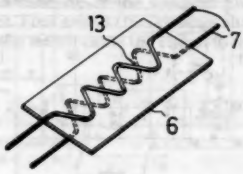
Filed Feb. 3, 1971, Ser. No. 112,356

Claims priority, application Japan, Feb. 4, 1970, 45/11614; May 11, 1970, 45/45823

Int. Cl. H02h *7/04*

U.S. Cl. 317—15 12 Claims

A small size transformer comprises a short-circuit inducing device placed within a coil of coils of the transformer and electrically connected between a primary coil and a power supply. The device comprises a spacer of an electrically insulative material capable of melting at a given temperature, and a pair of conductors electrically insulated from each other by the spacer, but closely spaced enough to contact each other upon melting of the spacer. This arrangement prevents the burning of the transformer upon occurrence of an overcurrent



flow through or short-circuit condition across the transformer coils by disconnecting the primary coil from the power supply.

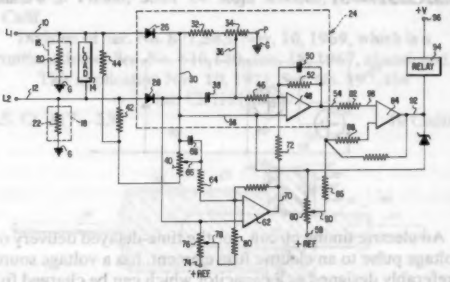
3,700,966
MONITORING CIRCUIT FOR DETECTING LEAKAGE CURRENTS

Paul Morrow, Basin Road, New Castle, Del.

Filed May 19, 1971, Ser. No. 144,914

Int. Cl. H02h *3/28*

U.S. Cl. 317—18 D 14 Claims



The leakage currents to ground from the power input conductors connected to a load are detected. When these leakage currents reach a selected magnitude, an amplifier responds to produce a usable output for indicating dangerous leakage current conditions. Detection takes place by means of a diode connected to each input conductor, the latter carrying an ac voltage, which diodes are connected in common to ground through a load resistor to provide paths for purely resistive leakage currents in phase with the ac voltage. An amplifier is connected to this load resistor to detect the in phase leakage currents. To detect out of phase or wattless leakage currents due to capacitive coupling between the input conductors and ground, a further diode, load resistor and amplifier combination is used and its output is summed with the in phase output to drive a further amplifier whose output is adjusted to operate only when the sum of the in phase and out of phase inputs reaches a selected value.

3,700,967
GROUND FAULT DETECTOR CIRCUIT

Robert J. Hoss, Plano, Tex., assignor to Zinsco Electrical Products, Los Angeles, Calif.

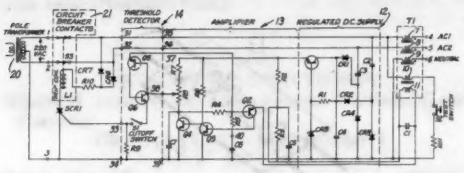
Filed Jan. 10, 1972, Ser. No. 216,526

Int. Cl. 323 *70;* H02h *3/28*

U.S. Cl. 317—18 D 19 Claims

A ground fault detector providing protection from leakage current to ground by sensing unbalance in supply and neutral conductor currents to actuate a circuit breaker. A solid state circuit including amplifier and detector and having the unbalance signal of a current transformer as an input for energiz-

ing a trip coil of the breaker when the unbalance current exceeds a predetermined level. Improved circuitry providing



temperature compensation, insensitivity to turn on and other transients and noise, and protection against overheating due to breaker hang-up.

3,700,968

ELECTRIC FUSE CIRCUIT

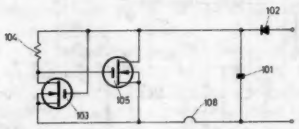
Johann Spies, Pfaffenhofen, Ilm, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munchen, Germany

Filed Dec. 30, 1971, Ser. No. 214,302

Claims priority, application Germany, Jan. 20, 1971, P 21 02 499.7

Int. Cl. H01h *47/18*

U.S. Cl. 317—31 **7 Claims**



An electric timing circuit, for the time-delayed delivery of a voltage pulse to an electric fuse element, has a voltage source, preferably designed as a capacitor which can be charged from an external source of electric potential. The capacitor discharges across a resistance and a threshold value switch connects the fuse element with the voltage source when the source voltage falls below a preset value. The threshold value switch is constituted by a first field effect transistor having its drain-source path in the electric timing circuit and a second field effect transistor having its drain-source path connected in parallel with that of the first transistor, and having an insulated grid electrode. The drain electrode of each transistor is connected to the grid electrode of the other transistor. The fuse element, in one embodiment of the invention, is in series with a thyristor whose gating circuit is connected to a resistor connected in the drain-source path of the second transistor. In a second embodiment of the circuit, the fuse element is connected in series with the source voltage capacitor and the drain-source path of the second transistor.

3,700,969

REPAIRABLE SEMICONDUCTOR ASSEMBLY

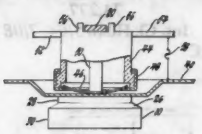
Thomas J. Furnival, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 14, 1972, Ser. No. 225,740

Int. Cl. H01l *1/12*

U.S. Cl. 317—40 R **3 Claims**

A transient suppressor for an electronic circuit includes a hermetically sealed housing for a Zener diode having a thin thermally conductive cover in thermal engagement with the Zener diode near the junction thereof and a heat dissipating member extending from the diode through the bottom of the package. A thermal circuit breaker seated in the depressed portion of the dish-shaped cover has a temperature responsive element normally in intimate engagement with the cover to sense the diode junction temperature. A base member supporting the diode housing and the circuit breaker carries a leaf spring for biasing the circuit breaker against the diode housing. The spring is removable to allow easy replacement of the



diode or the circuit breaker when defective. External circuit connections which may include a fuse, places the circuit breaker in series with the Zener diode to prevent current flow through the diode when the junction temperature reaches a critical point.

3,700,970

CURRENT CIRCUIT BREAKER

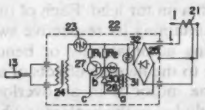
Noriomi Miyoshi, Kawasaki, Japan, assignor to Fuji Denki Seizo Kabushiki Kaisha, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 791,635, Jan. 16, 1969, abandoned. This application Feb. 18, 1971, Ser. No. 116,587

Claims priority, application Japan, Jan. 20, 1968, 43/3183; Jan. 31, 1968, 43/6193

Int. Cl. H01h *3/08*

U.S. Cl. 317—58 **8 Claims**



The electrical energy for detonating an explosive in a circuit-opening mechanism of a current circuit breaker to cut a circuit path is derived through a current transformer from the circuit path to which the circuit breaker itself is connected. The circuit-opening mechanism can thereby be exploded to cut the circuit path without the necessity of supplying electrical energy from any outside agency other than the circuit path. Furthermore, rapid extinguishing of the arc generated by the circuit path cutting is afforded by an insulative medium blown against the arc by the explosion, and the path parts thus cut apart are prevented by a unique construction from recontacting to remake the circuit.

3,700,971

ELECTROMECHANICAL INTERVALOMETER, AND METHOD OF USING SAME

Charles E. Everest, Los Angeles, and Henry P. Voznick, Arcadia, both of Calif., assignors to William Wahl Corporation, Los Angeles, Calif.

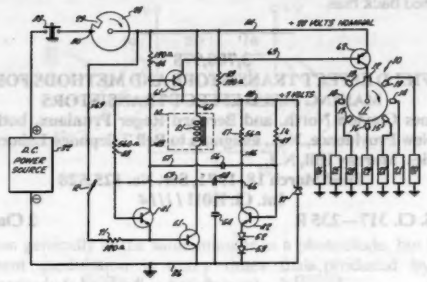
Continuation-in-part of Ser. No. 882,431, Dec. 5, 1969, abandoned. This application Jan. 29, 1971, Ser. No. 111,048

Int. Cl. F23g *21/00*

U.S. Cl. 317—80 **50 Claims**

Apparatus and method for effecting firing, at predetermined intervals, of rockets, flares or the like. An astable, asymmetrical multivibrator oscillator is adapted to maintain energized, during the major portion of each cycle of oscillation, a solenoid which operates a stepping switch connected to the rockets. The multivibrator is adapted to complete a firing circuit through the stepping switch during the remaining or minor portion of each oscillatory cycle. The relative lengths of the cycle portions are so correlated to the firing times and shock wave-transmission times of the rockets that the solenoid is energized when the shock resulting from any firing reaches

the stepping switch. The multivibrator is so constructed that pressing of the pilot-operated start button always effects initiation of operation of the long (major) portion of the cycle, but



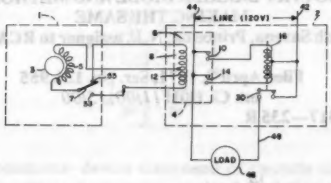
for only an abbreviated time period adapted to effect initial stepping of the stepping switch. An isolated power storage capacitor maintains operation of the multivibrator during temporary power dropouts.

3,700,972

WIRE OPERATED REMOTE CONTROL SYSTEM

Reginald A. Bates, Chittenango, N.Y., assignor to Pass & Seymour, Inc., Syracuse, N.Y.

Filed April 16, 1971, Ser. No. 134,772
Int. Cl. H01h 47/22
U.S. Cl. 317—137 **19 Claims**



A system for remotely controlling the energization of a load is disclosed. The system may be used for example to turn on and off lights, motors and the like. With this system the voltage being controlled is not utilized for control purposes. The system comprises a switch capable of generating a control voltage and a relay assembly actuated by the switch. The switch assembly comprises a magnet and coil so arranged that movements of the switch handle causes the magnet to rotate and induce a voltage in the coil. This voltage is transmitted by wire to the relay assembly which comprises an "on" reed relay, an "off" reed relay and a power relay. The power relay comprises an "on" latch coil and an "off" latch coil. When the "on" latch coil is energized voltage is applied to the load and when the "off" latch coil is energized the voltage is removed from the load.

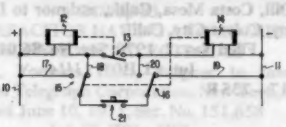
3,700,973

RELAY COUNTING CIRCUIT

Bjorn J. Gruenwald, Easton, Pa., assignor to Alpha Press Electronics, Inc., Alpha, N.J.

Filed Sept. 17, 1971, Ser. No. 181,461
Int. Cl. H01h 47/00
U.S. Cl. 317—140 **5 Claims**

A relay circuit responsive to input impulses, represented by the closings and openings of a push button switch, wherein the relay circuit includes at least two relay windings and contacts and conductors interconnected to permit each closing and each opening of the push button switch to bring about a change in the energization state of the relays in the circuit. The basic circuit includes two windings in series circuit relationship with a contact set operated by one of the windings, the other winding being coupled to operate two single-pole double-throw contact sets capable of connecting one of two shunt circuits across one of the windings and the normally open contact set. Four events (two closings and two openings) of the push button switch cause the circuit to take four distinct



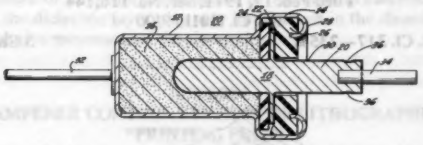
and identifiable states. Outputs from the winding can be used to feed an appropriate logic circuit and display means, if desired. More sophisticated versions using transistor relay drive and embodiment using sets of four and six relay windings, with appropriate steering diodes and the like, are disclosed. In each case each relay contact set opens and closes under conditions of zero potential difference, thereby eliminating arcing and greatly extending contact life.

3,700,974

ELECTROLYTIC CELL WITH INNER ELECTRODE HAVING NON-REACTIVE SURFACE

Edward J. Plehal, 5321 De Roja Avenue, Woodland Hills, Calif.

Division of Ser. No. 871,583, Nov. 10, 1969, which is a continuation of Ser. No. 610,140, Jan. 18, 1967, abandoned. This application Nov. 10, 1971, Ser. No. 197,454
Int. Cl. H01g 9/04
U.S. Cl. 317—230 **10 Claims**



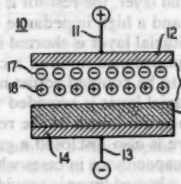
The present invention relates to a particular structure for electrolytic cells. The present invention is particularly directed to structures for the inner electrodes of electrolytic cells and to methods of manufacturing such inner electrode structures wherein a base member is provided which is formed under pressure and which requires a thin layer of an inert material to be plated on the base member.

3,700,975

DOUBLE LAYER CAPACITOR WITH LIQUID ELECTROLYTE

Alexander Duane Butherus, and Kenneth Russ Newby, both of Murray Hill, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Nov. 12, 1971, Ser. No. 198,320
Int. Cl. H01g 9/00
U.S. Cl. 317—230 **10 Claims**



A capacitor utilizing the space charge polarization effect is described. The device employs a liquid electrolyte, resulting in

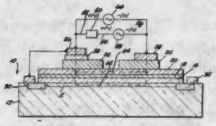
a high capacitance-to-volume ratio, and a higher voltage than usually found in such devices. The capacitor is intended primarily for use in filter applications in transistor circuits.

3,700,976

INSULATED GATE FIELD EFFECT TRANSISTOR ADAPTED FOR MICROWAVE APPLICATIONS

Hans G. Dill, Costa Mesa, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 2, 1970, Ser. No. 86,017
Int. Cl. H01l *11/14*
U.S. Cl. 317—235 R **5 Claims**



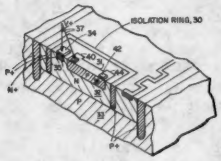
Solid state field effect switch devices useful in microwave applications. Devices disclosed embody resistive noninsulative layer material insulated from a supporting semiconductor body. Electrodes connected to the layer material and the body are arranged so that signals applied to one electrode can, by field effect action, alter the electrical conductivity of a path within the device which extends between two other electrodes.

3,700,977

DIFFUSED RESISTOR

Gerald K. Lunn, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 17, 1971, Ser. No. 116,144
Int. Cl. H01l *19/00*
U.S. Cl. 317—235 R **3 Claims**



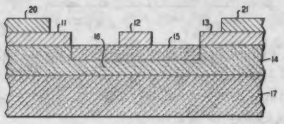
There is disclosed an improved technique for reducing or eliminating parasitic capacitance associated with diffused resistors in which the normal buried layer is eliminated and in which each resistor is either fully or partially surrounded by an isolation ring. The epitaxial layer between the resistive element and the isolation ring is provided with a back bias either at one end of the resistor or at the point along the resistor at which no signal exists. In one case this may be accomplished by shorting the epitaxial layer to the low impedance end of the resistor. In the embodiment in which one end of the resistor is shorted to the epitaxial layer, the resistor is polarized having a low impedance end and a high impedance end, such that the end to which the epitaxial layer is shorted is the end which is coupled to the low impedance node of a circuit. In the case where the resistor is to be coupled across nodes having equal impedance, the epitaxial layer is provided with back bias adjacent that point along the length of the resistor at which no signal appears. There is also disclosed a guard circuit, which minimizes parasitic capacitance in cases where a low resistivity epitaxial layer or a buried layer is provided. The guard circuit is in the form of an impedance convertor having a high impedance output applied to the high impedance end of the resistor while the low impedance of the convertor is coupled to an epitaxial layer contact adjacent this high impedance end. In the guard circuit embodiment, an additional epitaxial layer contact is provided adjacent the low impedance end of the resistor and is shorted thereto so as to provide the aforementioned back bias.

3,700,978

FIELD EFFECT TRANSISTORS AND METHODS FOR MAKING FIELD EFFECT TRANSISTORS

James Clayton North, and Bernard Roger Pruniaux, both of New Providence, N.J., assignors to Bell Telephone Laboratories, Murray Hill, N.J.

Filed March 18, 1971, Ser. No. 125,528
Int. Cl. H01l *11/14*
U.S. Cl. 317—235 R **2 Claims**



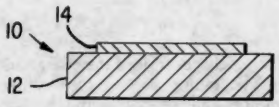
The insulative gate layer of an insulated gate field effect transistor (IGFET) is made by exposing a channel region of a semiconductor wafer to high energy proton bombardment. The bombardment damages the crystal structure of the semiconductor to a predetermined depth to make that part of the semiconductor nonconductive.

3,700,979

SCHOTTKY BARRIER DIODE AND METHOD OF MAKING THE SAME

Arjun Nath Saxena, Princeton, N.J., assignor to RCA Corporation

Filed April 7, 1971, Ser. No. 131,955
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 317—235 R **4 Claims**



A Schottky barrier diode diode including a body of P type single crystalline silicon and a film of hafnium on a surface of the body and forming a surface barrier rectifying junction with the body. The diode has a barrier height of approximately 0.90 electron volts.

3,700,980

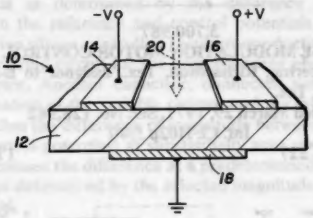
SCHOTTKY BARRIER PHOTOTRANSISTOR

Melvin Belasco, Dallas, and Sebastian R. Borrello, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 652,653, July 5, 1967, abandoned. This application April 8, 1971, Ser. No. 132,368
Int. Cl. H01l *15/00*
U.S. Cl. 317—235 R **12 Claims**

Disclosed is a metal-semiconductor-metal phototransistor formed by a pair of closely spaced, thin metal films in rectifying contact with the surface of a lightly doped p-type indium arsenide substrate. The spacing between the metal films is substantially less than the diffusion length of a minority carrier in the indium arsenide at the operating temperature, which is on the order of −78° C. One metal film may be considered the collector region, the semiconductor material the base region, and the other metal film the emitter region. When the

transistor is biased like an NPN transistor, the collector current is varied in proportion to the radiation striking the base



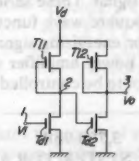
region generally in the same manner as a photodiode, but the current modulation is many times that produced by a photodiode for a given radiation level.

3,700,981

SEMICONDUCTOR INTEGRATED CIRCUIT COMPOSED OF CASCADE CONNECTION OF INVERTER CIRCUITS

Toshiaki Masuhara, Tokorozawa; Minoru Nagata, Kodaira, and Masharu Kubo, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 24, 1971, Ser. No. 146,154
Claims priority, application Japan, May 27, 1970, 45/44892
Int. Cl. H01l *19/00*
U.S. Cl. 317—235 R **2 Claims**



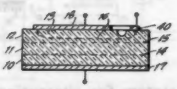
A semiconductor device composed of cascade connected inverter circuits each comprising a load depletion type MIS transistor and a driving enhancement type MIS transistor. The semiconductor device can be properly operated by setting the threshold voltage of the load MIS transistors at a predetermined value, by selecting the dimensions and materials thereof.

3,700,982

CONTROLLED RECTIFIER HAVING GATE ELECTRODE WHICH EXTENDS ACROSS THE GATE AND CATHODE LAYERS

Harold Weinstein, Van Nuys, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Dec. 12, 1968, Ser. No. 751,804
Int. Cl. H01l *11/10*
U.S. Cl. 317—235 R **7 Claims**



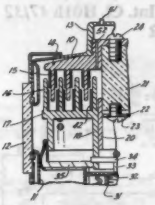
To permit high rate-of-rise-of-current in a controlled rectifier, the gate electrode extends from the emitter region across the uppermost junction and into contact with the opposite conductivity region under the cathode electrode. When a positive pulse is applied to the gate, the cathode region adjacent the gate is less negatively charged than it would otherwise be if placed conventionally on the P region only. This will reduce current concentration at the emitter edge adjacent to the gate region so that a greater rate-of-rise-of-current is permissible. A groove is interposed between the gate and cathode electrode providing a means of adjusting the impedance between both. This permits limiting of excessive gate-cathode currents through the joining N emitter layer.

3,700,983

VARIABLE CAPACITOR HAVING A SOLID DIELECTRIC BETWEEN ITS ELECTRODES

Manlio Goetzl, Yonkers, N.Y., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 10, 1971, Ser. No. 151,658
Int. Cl. H01g *5/02*
U.S. Cl. 317—245 **13 Claims**



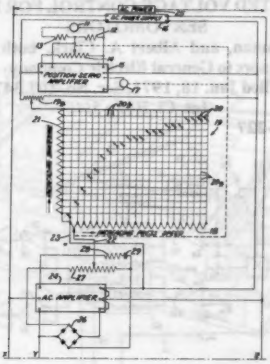
A capacitor having a stationary electrode, a movable electrode, and a solid dielectric material between the electrodes. The solid dielectric occupies no more than a portion of the gap between the electrodes, and the remaining portion may be filled by a pressurized gas. Each electrode may be a series of spaced concentric tubular plates interleaved with the plates of the other electrode. The solid dielectric may be a layer covering some or all of the plate surface of one or both electrodes, and the dielectric layer may vary in thickness in the direction of relative movement of the electrodes.

3,700,984

DAMPENER CONTROL SYSTEM FOR LITHOGRAPHIC PRINTING PRESS

William H. Rouse, Downers Grove, Ill., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed March 8, 1971, Ser. No. 121,875
Int. Cl. H02p *5/46*
U.S. Cl. 318—77 **4 Claims**



A dampening system for a lithographic printing press which has a plurality of feed motors for controlling the rate at which dampening fluid is supplied to the printing plate in the press. The system includes a tachometer generator for producing an electrical signal representing the press speed, and means for converting the electrical signal to a mechanical displacement.

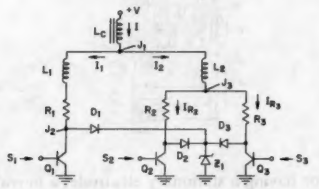
The mechanical displacement is applied to a resistor matrix which produces a second electrical signal which represents a predetermined non-linear function of the press speed, with the particular nature of the function being determined by the setting of the resistor matrix. This second electrical signal is supplied to the speed control means associated with the feed motors so as to automatically vary the speed of the feed motors according to the predetermined non-linear function of the press speed.

3,700,985

METHOD AND CIRCUIT FOR DRIVING INDUCTIVE LOADS

James E. Applequist, Saratoga, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Dec. 17, 1970, Ser. No. 99,129
Int. Cl. H01h *47/32*
U.S. Cl. 317—148.5 R **15 Claims**



The relative current in a pair of inductive loads is rapidly varied by maintaining a current in each load, so that when current is removed from one the rapid decay of current in that coil permits a substantial relative current differential since the other load need not rise from zero current due to the current pre-established therein. To further enhance the rapid current differential a choke in series with a low voltage supply provides a constant current source so that a large voltage spike is generated when the current goes to zero in one load thus enhancing the current buildup in the other load.

ERRATUM

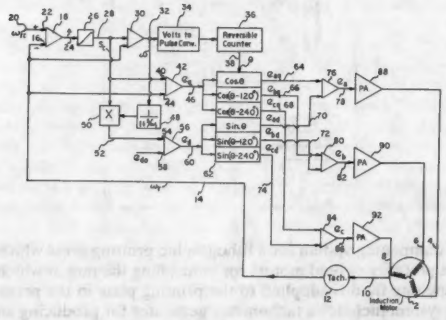
For Class 318—77 see:
Patent No. 3,700,984

3,700,986

CO-ORDINATED VOLTAGE CONTROL FOR INDUCTION SERVOMOTORS

Paul G. Cushman, and Albert A. Clark, both of Pittsfield, Mass., assignors to General Electric Company

Filed Jan. 18, 1971, Ser. No. 107,347
Int. Cl. H02p *5/40*
U.S. Cl. 318—227 **6 Claims**



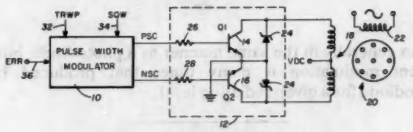
A system for control of an induction motor at all speed and load conditions through the application of stator voltages which are co-ordinated with respect to magnitude, frequency and phase to maintain rated flux and a quadrature special relationship between air-gap flux and rotor current.

3,700,987

PULSE MODULATION MOTOR CONTROL

Charles S. Deering, Richardson, Tex., assignor to E-System, Inc., Dallas, Tex.

Filed March 29, 1971, Ser. No. 128,962
Int. Cl. H02p *5/40*
U.S. Cl. 318—227 **17 Claims**



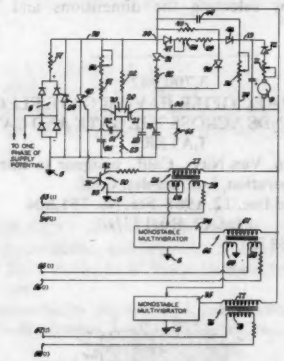
A typical alternating current servomotor has two windings displaced 90°; these windings are identified as a reference winding and a control winding. Rotational direction and speed of the motor may be controlled by applying AC voltages of the proper wave form, amplitude and phase relationship to these windings. When controlling the direction of rotation and speed of the motor in accordance with a DC error signal, pulse width modulation techniques are employed. The error signal is compared with a triangular wave function to generate a first and second series of pulses each having a width related to the magnitude of the error signal. These series of pulses are logically combined with a square wave function to produce first and second digital motor energizing signals. The motor energizing signals control a power amplifier switch connected to the windings of the motor to be controlled.

3,700,988

SPEED CONTROL SYSTEM FOR ALTERNATING CURRENT INDUCTION MOTORS

Bohdan I. Pryjmak, Dayton, Ohio

Filed May 27, 1971, Ser. No. 147,459
Int. Cl. H02p *5/40*
U.S. Cl. 318—227 **3 Claims**



A speed control system for alternating current induction motors wherein a reference potential, which is a rectified phase of the alternating current supply potential, is connected across the series combination of a variable resistor and the timing capacitor of a unijunction transistor type relaxation oscillator circuit and a direct current control potential, which is a function of motor speed and which may be selectively varied in magnitude to change the speed of the motor, is connected across the variable resistor in the same polarity rela-

tionship as the reference potential. The unijunction transistor type relaxation oscillator circuit and associated circuitry produces a trigger signal at the electrical angle of each potential cycle of each phase of the alternating current supply potential as determined by the difference of magnitude between the reference and control potentials which trigger respective silicon controlled rectifiers conductive to complete an energizing circuit for the corresponding phase winding or the motor. Another capacitor, connected across the series combination of the variable resistor and the timing capacitor, establishes the difference of magnitude between the reference and control potentials at substantially zero upon motor start and increases the difference at a predetermined rate to a maximum as determined by the selected magnitude of the control potential.

3,700,989

CONTROL SYSTEM FOR AN ALTERNATING CURRENT MOTOR

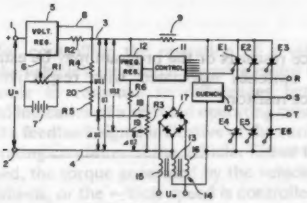
Arne Jensen, Skolegade, Havnbjerg, near Nordborg, Denmark, assignor to Danyoss A/S., Nordborg, Denmark

Continuation of Ser. No. 805,177, March 7, 1969, abandoned. This application March 31, 1971, Ser. No. 129,966

Claims priority, application Germany, March 16, 1968, P 16 13 775.0

Int. Cl. H02p *5/40*

U.S. Cl. 318—227 **3 Claims**



The invention relates to a control system for an alternating current motor such as a polyphase induction motor. The control system includes a DC to AC inverter in combination with voltage and frequency regulators with the voltage and frequency being dependent upon each other. Control means are provided which sense the inverter current and translate the data sensed into two voltages which are separately subtracted from the output of the voltage regulator to provide two corrected voltages for regulating the voltage regulator and the frequency regulator.

3,700,990

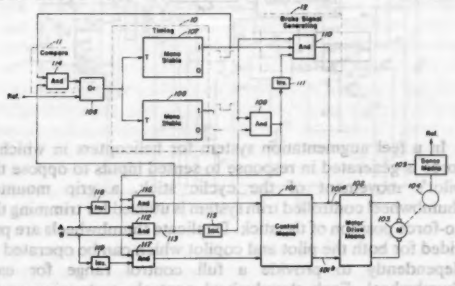
BRAKING METHODS AND APPARATUS

David R. Shuey, Webster, and Roger F. Norian, Williamson, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 25, 1971, Ser. No. 118,827

Int. Cl. H02p *3/14*

U.S. Cl. 318—375 **25 Claims**



Braking methods and the apparatus therefor are provided in accordance with the teachings of the present invention. According to one embodiment of this invention the rotation of a rotating device is detected and the angular disposition thereof is determined. The relative angular disposition of said rotating device is compared with the time of occurrence of a condition requiring the arrest of said rotating device. A brake signal adapted to produce hysteresis braking of the rotating device is generated in accordance with the comparison, whereby the velocity of said rotating device is rapidly reduced such that said rotating device halts at a desired angular disposition.

3,700,991

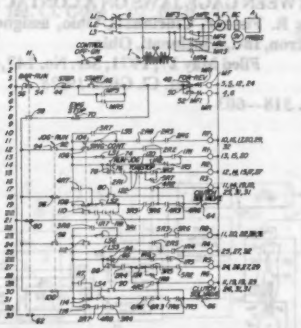
MACHINE CONTROL CIRCUIT

Edward J. Freeland, Hastings, Mich., assignor to Gulf & Western Industrial Products Company, Salem, Ohio

Filed Sept. 23, 1971, Ser. No. 183,202

Int. Cl. H02p *15/00*

U.S. Cl. 318—447 **14 Claims**



A control circuit for a press is arranged for requiring an operator to hold control buttons depressed for more than one complete press cycle before it will run in a continuous mode.

3,700,992

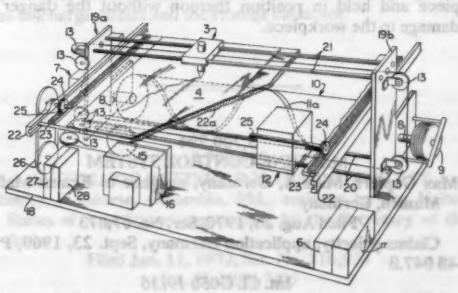
CURVE TRACER

Jacques A. Pontigny, Montmorency, France, assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed July 26, 1971, Ser. No. 165,472

Int. Cl. G05b *19/42*

U.S. Cl. 318—568 **14 Claims**



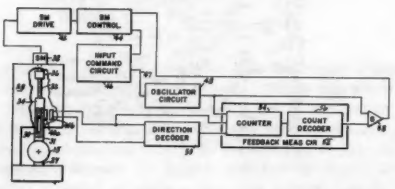
A curve tracer of two variables respectively represented on axes of variables Y and X on a recording rack, capable of being removed at a speed depending upon the first of the said variables, said tracer comprising a first regulation loop having a first movable organ, the removal of which is regulated by the variations of the second of the said variables, a second regula-

tion loop having a second movable organ, allowing to trace a curve on the said recording rack, a scale transformation device, mechanically coupled with the first said movable organ and having a second recording rack on which is traced a scale transformation curve representing for each value to be transformed of the second variable, represented on the axis of X, a transformed value represented on the axis of Y, and detector means mounted in the second said regulation loop and adapted so as to be able to move along the axis of Y of the curve of the said second recording rack, the movement of the second movable organ being regulated by the movement of the detector means.

3,700,993
APPARATUS FOR CONTROLLING RELATIVE MOTION BETWEEN GAGE JAWS ON A CONTACTING GAGE

Thomas R. Fischer, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed May 27, 1971, Ser. No. 147,432
Int. Cl. G05b *19/28*
U.S. Cl. 318—603 **4 Claims**



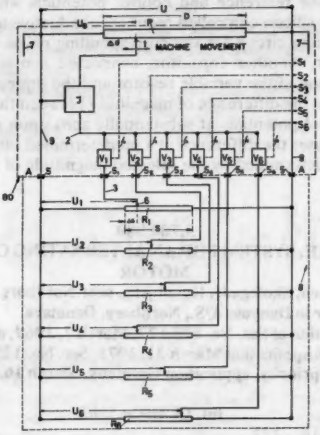
An apparatus for controlling the relative motion and final position between gage jaws on a contacting type of gage. A driving mechanism is coupled to one of the gage jaws to provide relative motion between said jaws. A command circuit supplies command signals to the driving mechanism. Each time the driving mechanism is commanded to move, a feed back circuit measures the actual motion of the gage jaw and produces a control signal in response to a predetermined magnitude of said motion. The control signal is used to gate a subsequent command signal to the driving mechanism. Consequently, the gage jaw can be brought in contact with a workpiece and held in position thereon without the danger of damage to the workpiece.

3,700,994
MACHINE-CONTROL SYSTEM

Max Gopfert, Munich, Germany, assignor to Krauss-Maffei, Munich, Germany

Filed Aug. 26, 1970, Ser. No. 67,073
Claims priority, application Germany, Sept. 23, 1969, P 19 48 047.8
Int. Cl. G05b *19/36*
U.S. Cl. 318—579 **1 Claim**

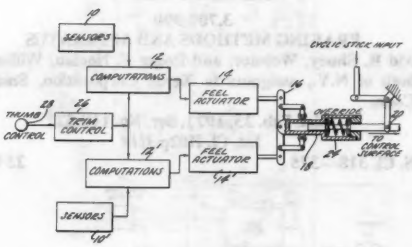
A machine-control system is disclosed wherein a potentiometer is connected to a moving machine part to produce a control signal which is compared with a reference voltage developed across a reference potentiometer to operate control circuitry through a comparator amplifier. The reference resistors are mounted on a replaceable plate interchangeable with other plates upon alteration of the machine program. Alternatively, or in addition, a programming plate may be provided for each program automatically to set a number of reference resistors or the program may be established by the use of switches associated with respective taps on the reference resistors.



3,700,995
TRIM REFERENCE FOR HELICOPTER FEEL AUGMENTATION SYSTEM

Gerald W. Parkinson, West Haven, and Jack R. Cutting, Trumbull, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed May 20, 1971, Ser. No. 146,570
Int. Cl. G05b *11/01*
U.S. Cl. 318—628 **5 Claims**



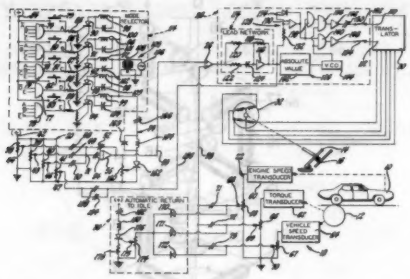
In a feel augmentation system for helicopters in which a force is generated in response to sensed inputs to oppose the pilot's movement of the cyclic stick, a grip mounted thumbwheel controlled trim system is utilized for trimming the no-force position of the stick. Duplicate thumbwheels are provided for both the pilot and copilot which can be operated independently to provide a full control range for each thumbwheel. Each thumbwheel controls a stepping motor which rotates either the case or the wiper of a potentiometer to provide the desired trim position signal.

3,700,996

REMOTE THROTTLE CONTROL VIA STEP MOTOR MOVEMENT AND RESPONSIVE TO VEHICLE OR ENGINE CONDITION

James I. Gutting, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 24, 1971, Ser. No. 183,552
Int. Cl. H02k 37/00
U.S. Cl. 318—696 2 Claims



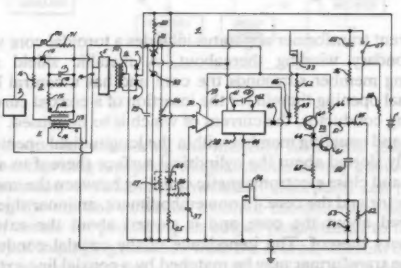
Apparatus for controlling the operation of a vehicle by manipulating the vehicle's throttle. A stepping motor manipulates the throttle in response to differences between a reference signal indicative of a selected operating condition of the vehicle and a feedback signal indicative of the corresponding actual operating condition of the vehicle. Either the vehicle engine speed, the torque generated by the vehicle engine at the driven wheels, or the vehicle speed is controlled by the apparatus. It also allows increasing any of these conditions at a uniform rate up to a predetermined maximum. If any of these conditions actually exceed certain maximums, the throttle is automatically returned to its normal setting, which may also be effected by the operator closing a certain switch.

3,700,997

RAPID CHARGING OF BATTERIES

Stephen Hagar Smith, Manhattan Beach, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Feb. 24, 1971, Ser. No. 118,420
Int. Cl. H01m 33/00; H02j 7/10
U.S. Cl. 320—20 15 Claims



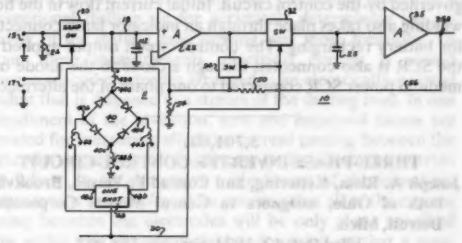
The high rate changing of a battery is terminated by monitoring the battery voltage during a fixed interval of time in which high rate charge current is removed. If the battery voltage decreases to a predetermined value in the fixed interval of time, then high rate charge current is again applied for a second fixed interval of time. The steps are repeated until the battery voltage with high rate charge current removed does not decrease to the predetermined value within the fixed interval of time.

3,700,998

SAMPLE AND HOLD CIRCUIT WITH SWITCHING ISOLATION

Don N. Lee, Lindenwold, and Roy B. McMennamin, Cinnaminson, both of N.J., assignors to Computer Test Corporation

Filed Aug. 20, 1970, Ser. No. 65,388
Int. Cl. G06g 7/02; H03f 1/00
U.S. Cl. 320—1 6 Claims



Sampling an unknown signal only for a single time interval and holding the resultant sampled signal value with these operations being substantially independent of frequency. A discharge circuit in shunt with the storage capacitor comprises a diode bridge having four matched diodes. A pair of common mode chokes are connected to the nodes of the diode bridge in order to provide isolation between the switching signal of the discharge circuit and the storage capacitor.

3,700,999

AUTOMATIC BATTERY POLARIZING CIRCUIT

Stanley J. Gourse, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed Jan. 11, 1972, Ser. No. 216,935
Int. Cl. H02j 7/00
U.S. Cl. 320—26 5 Claims

Disclosed is and automatic battery polarizing circuit employing transistors in the arms of a bridge circuit configuration wherein the transistors are operative to couple a battery connected to the input thereof in a manner that the bridge output voltage will always be of the same polarity regardless of how the battery is connected to the bridge input with respect to polarity.

3,701,000

ELECTRONIC DEVICE FOR REGULATING THE VOLTAGE OF ALTERNATORS, PARTICULARLY FOR MOTOR VEHICLES

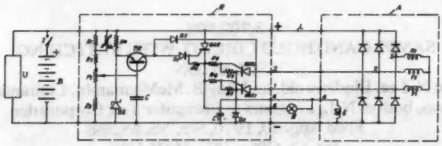
Eugenio Basso, Levico; Guglielmo Ravaschio, Genova, and Vittorio Frangilli, Gallarate, all of Italy, assignors to Fabbrica Italiana Magneti Marelli S.p.A., Milano, Italy

Filed April 8, 1971, Ser. No. 132,515

Claims priority, application Italy, April 11, 1970, 23183 A/70

Int. Cl. H02p *9/30*

U.S. Cl. 320—64 **2 Claims**



An alternator for a motor vehicle is provided with an electronic device for regulating output voltage. The field winding of the alternator is energized through a power circuit controlled by an SCR triggered by a control circuit when voltage drops below a preset value. The triggering signal to the SCR and initial flow in the field winding through the SCR is governed by-the control circuit. Initial current flow in the field winding also takes place through an indicator lamp connected for battery recharging. The control circuit output applied to the SCR is also connected through a diode to the anode of a medium power SCR connected to one phase of the alternator.

3,701,001

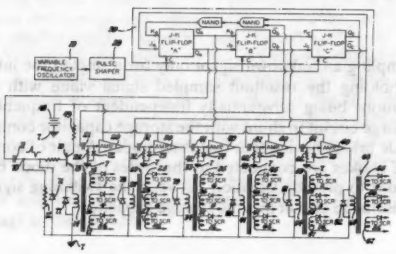
THREE-PHASE INVERTER CONTROL CIRCUIT

Joseph A. Riess, Kettering, and Conrad P. Vespie, Brookville, both of Ohio, assignors to Genral Motors Corporation, Detroit, Mich.

Filed Oct. 12, 1971, Ser. No. 188,083

Int. Cl. H02m *7/48*

U.S. Cl. 321—5 **4 Claims**



A three-stage shift register circuit, responsive to the output signals of a variable frequency oscillator, produces a repeating series of six equally spaced electrical timing signals. A differentiating circuit corresponding to each electrical timing signal is responsive to the leading edge of each corresponding electrical timing signal to produce a corresponding gate signal pulse. Each gate signal pulse is amplified by a corresponding amplifier, the output of which is connected across the primary winding of a pulse transformer having three secondary windings, a respective secondary winding of each pulse transformer is connected across the gate-cathode electrodes of each the extinguishing silicon controlled rectifier of a three-phase inverter circuit through which a three-phase motor may be energized from a direct current supply potential source which corresponds to the inverter silicon controlled rectifier to be extinguished, the inverter silicon controlled rectifier next to be triggered conductive and the inverter silicon controlled rectifier last triggered conductive.

3,701,002

VOLTAGE-MULTIPLYING RECTIFIER APPARATUS

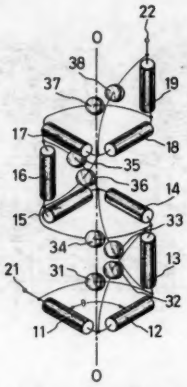
Takao Toba, Yokohama, Japan, assignor to Denki Onkyo Co., Ltd., Ohtaku, Tokyo, Japan

Filed March 13, 1972, Ser. No. 233,959

Claims priority, application Japan, March 13, 1971, 46/16768

Int. Cl. H02m *7/00*

U.S. Cl. 321—15 **19 Claims**



A voltage-multiplying rectifier apparatus comprised of a plurality of rectifier elements which are connected in series and a plurality of capacitors which are connected in parallel with said rectifier elements, wherein the rectifier elements are spirally arranged around a vertical axis of the apparatus.

3,701,003

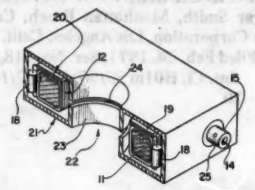
CURRENT TRANSFORMERS WITH IMPROVED COAXIAL FEED

John M. Anderson, Scotia, N.Y., assignor to General Electric Company

Filed Dec. 14, 1970, Ser. No. 97,918

Int. Cl. G01r *19/00*; H01f *40/06*

U.S. Cl. 323—6 **9 Claims**



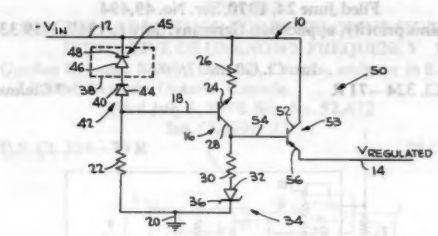
Current transformer apparatus includes a toroidal core with a secondary winding thereabout. A metallic shield and coupling member surrounds the core and has a central longitudinal opening therein for the insertion of a coaxial current carrying conductor, the current of which is to be sensed. The shield and coupling member within the longitudinal opening is laterally slotted about the cylindrical surface thereof to allow direct and close electromagnetic coupling between the coaxial conductor and the core. In one embodiment, an inner shield is provided about the core and is slotted about the exterior periphery thereof. The impedance of the coaxial conductor and the transformer may be matched by a coaxial line extending through the opening in the shield and coupling member to optimize coupling. In another embodiment, a secondary winding terminating resistance is variable by inclusion in a removable coaxial resistance cartridge. Several transformers may be cascaded in tandem by passing the output of one coaxially into the input of another.

3,701,004

CIRCUIT FOR GENERATING A REPEATABLE VOLTAGE AS A FUNCTION OF TEMPERATURE

Thomas E. Tuccinardi, Silver Spring, and Joseph W. Miller, Jr., Oxon Hill, both of Md., assignors to The United States of America as represented by the Secretary of the Army

Filed May 13, 1971, Ser. No. 143,071
Int. Cl. G05f 3/14
U.S. Cl. 323—69 10 Claims



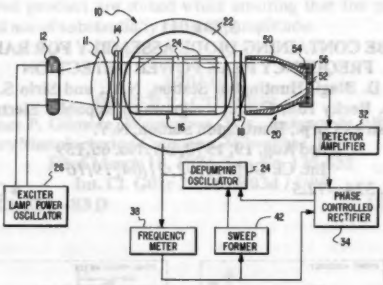
A circuit for producing a repeatable predetermined voltage as a function of temperature and includes a component having a known temperature coefficient characteristic. A transistor stage connected to the component multiplies the temperature coefficient. Linear as well as non-linear temperature characteristics can be multiplied by the circuit.

3,701,005

APPARATUS

Ralph E. Hartline, Tulsa, Okla., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Jan. 4, 1968, Ser. No. 695,785
Int. Cl. G01r 33/08
U.S. Cl. 324—0.5 R 12 Claims



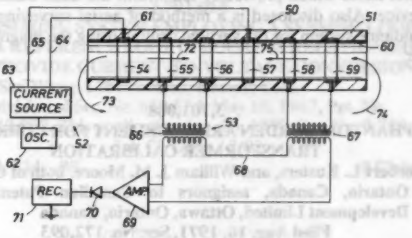
A device for measuring the intensity of minute magnetic fields comprising an optical magnetometer having a source for the emission of radiation, a radiation absorption cell means having the emitted radiation directed therethrough, and detector means for producing an output proportional to the intensity of impinging radiation from the source, wherein the detector means comprises a paraboloidal mirror and a detector element sensitive to the radiation and arranged within the mirror in a plane parallel to and in front of the latus rectum of the mirror, the open end of the mirror facing the cell means and having a diameter sufficient to receive the full beam of radiation passing through the cell whereby the radiation is collected by the mirror and directed toward the detector element.

3,701,006

METHODS AND APPARATUS FOR MEASURING THE ELECTRICAL RESISTIVITY OF FLOWING DRILLING MUDS

George D. Volkel, and Milton E. Cram, both of Houston, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Nov. 5, 1970, Ser. No. 87,037
Int. Cl. G01n 27/42
U.S. Cl. 324—30 R 15 Claims



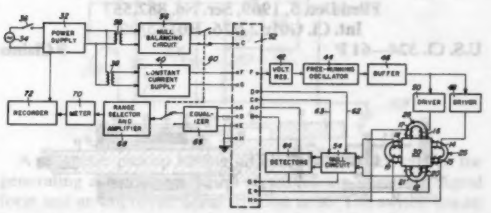
As a representative embodiment of the invention disclosed herein, one or more electrical measuring devices are placed at selected locations in the drilling mud circulating system of a conventional drilling rig for accurately determining the resistivity of the drilling mud flowing past those locations. To obtain these measurements, electrical current is passed between spaced electrodes arranged in an electrically-isolated conduit that is disposed in a stream of the drilling mud. In one embodiment of the invention, new and improved means are provided for measuring all of the current passing between the electrodes regardless of the diverse paths which the current may follow. In an alternative embodiment of the invention, unique means are employed for assuring that all of the current passing between the electrodes will be only along specified paths within the electrically-isolated conduit so that a measurement of the current flowing along only of these specified paths will be sufficient for accurately determining the resistivity of the mud. New and improved thermally-responsive control means are also disclosed for converting the resistivity measurements obtained while practicing the present invention to resistivity measurements at a selected temperature.

3,701,007

MAGNETOMETER CONSISTING OF TWO SENSORS WITH MEANS FOR UNBALANCING EACH SENSOR AT NULL CONDITION

Charles A. Schad, Tulsa, Okla., assignor to Kalium Chemicals Limited, Regina, Saskatchewan, Canada

Continuation-in-part of Ser. No. 791,039, Jan. 14, 1969, abandoned. This application July 21, 1971, Ser. No. 164,558
Int. Cl. G01r 33/04
U.S. Cl. 324—43 R 34 Claims



A highly sensitive magnetometer consisting of at least one pair of generally rectangular core elements having square hysteresis loops is disclosed. The primary windings of each of the cores are driven by an oscillator, with the secondary

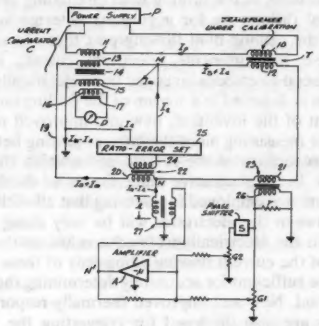
windings of each core being differentially connected through a null circuit, which serves to balance the effects of background fields, and a detector to a suitable indicator. The primary windings of the cores are operated in a resonance and the secondary windings are arranged to provide a high null output which eliminates the dead band caused by the threshold value of the diodes in the output detector circuit. This high null output may be accomplished by unbalancing the core windings or by feeding a portion of the primary winding drive current, or a signal synchronous therewith, to the corresponding secondary winding, thereby permitting measurement of the small magnetic fields which previously fell within the dead band of the device. Also disclosed is a method of aerial surveying and a guidance system for off-vertical drilling using the magnetometer.

3,701,008

PHANTOM BURDEN ARRANGEMENT FOR CURRENT TRANSFORMER CALIBRATION

Norbert L. Kusters, and William J. M. Moore, both of Ottawa, Ontario, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Aug. 16, 1971, Ser. No. 172,093
Int. Cl. G01r *31/06*
U.S. Cl. 324—55 **8 Claims**



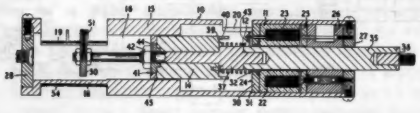
The power and reactive volt-amperes normally dissipated to furnish a burden are returned to the power supply either through a current comparator or an auxiliary current transformer. This effect is achieved by the use of an amplifier connected to generate a voltage that is an adjustable complex function of the secondary current of the calibration circuit, such voltage being applied across the secondary of the transformer undergoing calibration in order to furnish an effective burden therefor.

3,701,009

ELECTROMECHANICAL TRANSDUCER

Douglas Albert Leadbeater, Cromer, England, assignor to George Salter & Co., Ltd., Straffordshire, England

Filed Dec. 5, 1969, Ser. No. 882,557
Int. Cl. G01r *27/26*; H01g *5/00*
U.S. Cl. 324—61 P **9 Claims**



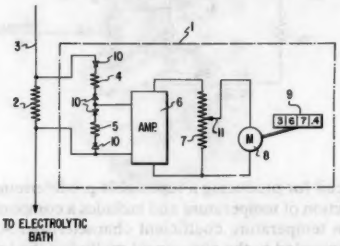
An electromechanical transducer, especially suitable for use with weighing apparatus for precision measurements, includes an oscillator providing an output of which the frequency is controlled by extent of displacement of a movable sensing member, and has fine adjustment means for setting the precise functional relationship between the change in output frequency and extent of displacement of the sensing member.

3,701,010

METAL WEIGHT COUNTER

Hans-Wilhelm Lieber, and Rolf Kramer, both of, Berlin, Germany, assignors to Fernsteuergerate Zacharia - Oelsch - Meier, Berlin, Germany

Filed June 24, 1970, Ser. No. 49,494
Claims priority, application Germany, July 1, 1969, P 19 33 261.7
Int. Cl. G01m *27/00*
U.S. Cl. 324—71 R **7 Claims**



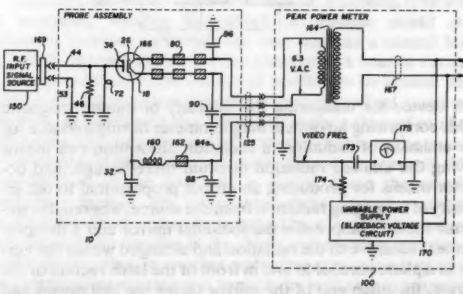
An instrument for measuring and indicating the weight of a material, in particular metals, converted in an electrolytic bath. In the instrument a voltage proportional to the current flowing through the bath is measured by means of a voltage divider connected in series with a preferably linearly divided potentiometer. The divider ratio is adapted to the equivalent weight of the particular element being converted, while the sliding contact of the potentiometer is set to compensate for the current efficiency of the particular electrolyte being utilized. The weight of the converted material is indicated by means of a counter mechanism which provides an indication proportional to the voltage at the output of the potentiometer.

3,701,011

PROBE CONTAINING DIODE ASSEMBLY FOR RADIO FREQUENCY PEAK POWER DETECTION

Alvaro D. Biagi, Huntington Station, N.Y., and Sirio S. D'Amato, Rocky Hill, Conn., assignors to Republic Electronics Industries Corp., Huntington Station, N.Y.

Filed Aug. 19, 1970, Ser. No. 65,159
Int. Cl. G01r *31/02, 21/04, 19/16*
U.S. Cl. 324—72.5 **4 Claims**



A probe assembly for applying to a peak power meter detected radio frequency signals whose peak power is to be measured, comprising a tubular conductive member having a plu-

rality of interconnected detachable cylindrical parts. A coaxial transmission line at one end of the tubular member receives the radio frequency signals which are applied to a disk resistor and an anode of a thermionic ceramic planar diode within the tubular member. The cathode of the diode is connected to a filter which includes a geometric capacitor. The diode detects the radio frequency signals and produces a video frequency envelope which after filtering is passed to the peak power meter.

3,701,012

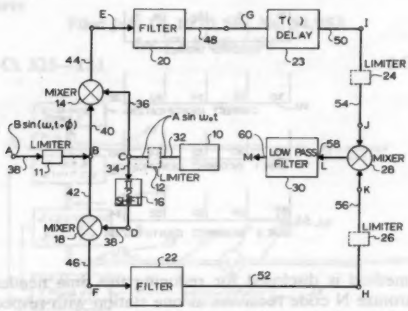
CIRCUIT AND METHOD FOR DEVELOPING SIGNAL INDICATIVE OF UNKNOWN FREQUENCY

Gordon R. Lang, Bolton, Ontario, Canada, assignor to E. S. E. Limited, Rexdale, Ontario, Canada

Filed July 6, 1970, Ser. No. 52,472

Int. Cl. G01r *23/14*

U.S. Cl. 324—79 R **28 Claims**



An unknown signal is mixed with a first reference signal and, in a separate mixing, with a second reference signal obtained by altering the phase of the first reference signal by $\pi/2$ radians (where the signals are of the same frequency). The sum or the difference product of the first mixing is filtered out and the corresponding product of the second mixing is also filtered out; one of the two last-mentioned products is delayed relative to the other, and then the undelayed product and the delayed product are mixed while ensuring that the products mixed are of substantially constant amplitude.

3,701,013

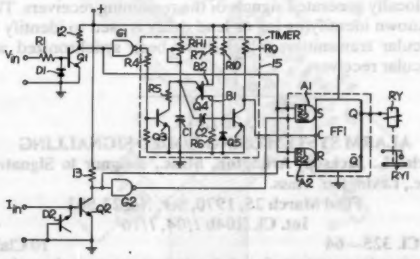
POWER FACTOR RELAY

Thomas P. Gilmore, Wauwatosa, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed March 18, 1971, Ser. No. 125,531

Int. Cl. G01r *25/00*; **H03d** *13/00*

U.S. Cl. 324—83 D **12 Claims**



Power factor measuring apparatus receives voltage and current input signals representative of the voltage on and the current in a power line and derives rectangular voltage and current pulses from half cycles of one polarity of the input signals. The timing cycle of an adjustable timer is initiated by the crossing of the zero axis by one of the input signals, and a clocked flip-flop receiving the timer output on its clock input and the rectangular pulse derived from the other input signal on a set input changes states to provide logic 1 on its Q output when the rectangular pulse is present when the timer output is received, thereby indicating that the phase difference between voltage and current input signals is greater than the power factor bandwidth established by adjustment of the timer delay interval.

3,701,014

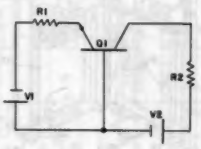
MEASURING SYSTEM EMPLOYING A SENSING LOOP AND A REFERENCE LOOP IN BUCKING RELATIONSHIP TO PROVIDE CURRENT-TO-VOLTAGE CONVERSION

Chien San Wang, 1201 Hudson, Denver, Colo.

Division of Ser. No. 639,534, May 18, 1967, Pat. No. 3,542,952. This application Jan. 23, 1970, Ser. No. 8,758

Int. Cl. G01r *17/02*

U.S. Cl. 324—98 **8 Claims**



This invention is a current-to-voltage conversion system. The use of the conversion system is in measuring AC or DC signals and in sound reproduction systems. The DC conversion system comprises a reference loop and a sensing loop connected in current bucking relation. A transistorized "zero junction circuit" senses the current differential between the two loops and generates an output voltage that is related to the current differential. The DC conversion system is used to sense current changes for a measuring instrument. the AC conversion system is used to sense output current flow in an audio reproduction system and to provide a feedback voltage directly related to the current flow, for example.

3,701,015

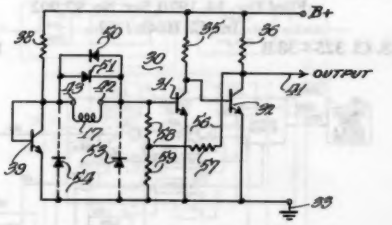
MAGNETIC PICKUP WITH FEEDBACK CIRCUIT

Kenneth C. Dittman, Deerfield, Ill., assignor to Electro Products Laboratories, Inc.

Filed Jan. 20, 1971, Ser. No. 108,052

Int. Cl. G01p *3/48*

U.S. Cl. 324—174 **1 Claim**



A magnetic pickup having an electronic switch circuit for generating a high level digital signal having improved signal form and an improved signal to noise ratio. The switch has an input transistor connected to a sensing coil and an output transistor which generates a digital output signal. The circuit further includes a feedback connection between the output transistor and the input transistor to stabilize operation for low level voltages induced in the pickup coil.

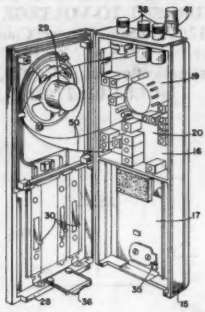
ERRATUM

For Class 324—158 F see:
Patent No. 3,701,021

3,701,016
MINIATURE TRANSMITTER RECEIVER HOUSING

Leonard W. Bennett, Berkeley; Thomas R. Hutchinson, Oak Park, and Winston H. Schilling, Park Ridge, all of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed April 14, 1969, Ser. No. 815,693
Int. Cl. H04b 1/40
U.S. Cl. 325—16 **7 Claims**

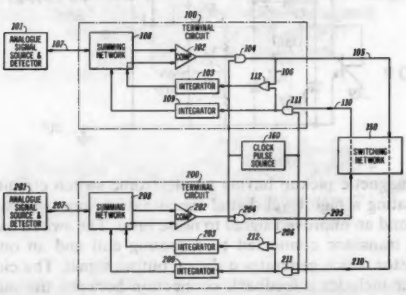


A radio transmitter and receiver housing is formed of a rectangular frame structure which is open at the front and back sides thereof. Separate front and rear cover means are detachably mounted to the rectangular frame structure to cover the front and rear openings. A printed circuit board carries substantially all of the components of the radio transmitter receiver device and is mounted within the rectangular frame structure. The circuit side of the printed circuit board is substantially level with one of the front and back openings. The rectangular frame structure is formed of a material having poor soldering characteristics and capable of withstanding soldering temperatures so that the components may be mounted on the printed circuit board and the assembly soldered without removal of the printed circuit board from the rectangular frame. The rectangular frame structure also permits the addition of other rectangular frame structures thereto to enlarge the size of the housing.

3,701,017
DELTA-MODULATION TERMINAL CIRCUIT

Rein Raymond Laane, Wheaton, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 14, 1970, Ser. No. 97,902
Int. Cl. H04b 1/52
U.S. Cl. 325—38 B **11 Claims**

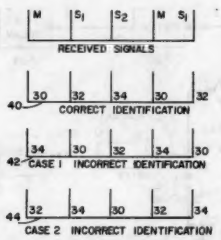


A delta-modulation coder-decoder terminal circuit in which incoming digital signals are applied to both the coder and decoder integrators. Reconstructed identical signal outputs of both relating to the digital input are applied to the inputs of the comparator via a summing network which also receives originating analogue signals for transmission. Cancellation of the incoming digital reconstructions is achieved thereby preventing regeneration of the latter for retransmission back to its source. The reconstructed incoming signal output from the decoder integrator is transmitted to the receiver via the summing network.

3,701,018
ACQUISITION METHOD FOR MULTI-TRANSMISSION POSITION LOCATING OR NAVIGATING SYSTEMS

Edward John Groth, Jr., Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 22, 1971, Ser. No. 117,493
Int. Cl. H04l 7/00
U.S. Cl. 325—58 **11 Claims**



A method is disclosed for reducing the time needed to synchronize N code receivers at one station with respect to ones of N code transmitters at different stations wherein all transmitters radiate the same code word, but time delayed relative to each other by fractional word length intervals which may be inversely proportional to the number (N) of transmitters and include an additional small time interval, which may be a lead or a lag, added to or subtracted from all codes but one for identification purposes. In the initial search mode of the synchronization, all N of the receivers are used with the receiver coders being moved together but retaining a fixed relationship with each other. Code words, which are generated locally in each receiver, and which are identical with the transmitted code words, are time-delayed with respect to each other by a fractional word length interval which may be inversely proportional to the square of the number of transmitters, whereby the initial search time for one of the receivers to lock up with or acquire one of the transmitters is reduced on the average to a small fraction equal to $1/2N^2$, for example, of a word length. When synchronization of any one transmitter with any one receiver is accomplished, the known delay between the transmissions (without taking into account the identification delay) is used to synchronize transmissions of the remaining transmitters with locally generated signals of the remaining receivers. Then the known identifying lag or lead delay is used to identify the particular transmitters which have been synchronized with particular receivers.

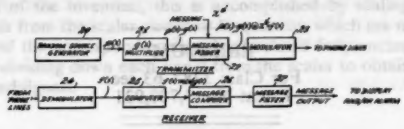
3,701,019
ALARM SYSTEM USING CODED SIGNALLING

Charles L. Jackson, Arlington, Mass., assignor to Signatron, Inc., Lexington, Mass.

Filed March 25, 1970, Ser. No. 22,503
Int. Cl. H04b 1/04, 1/16
U.S. Cl. 325—64 **10 Claims**

A signaling system for detecting at a central station a message from a remote location at which one or more different messages can be generated. A coded signal is generated at the remote location and an "error" uniquely determined by the message to be transmitted is inserted into the coded signal

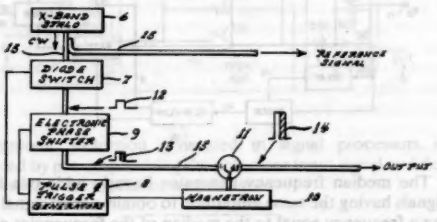
and the altered signal transmitted. A receiver at the central station is arranged to detect the presence of such inserted "error" so as to correctly identify the message that has been transmitted, whereby such message can be displayed or used to activate an alarm device.



3,701,020
PHASE CODED RF PULSE GENERATOR

Peter A. De Vito, Chelmsford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force

Filed July 15, 1970, Ser. No. 54,953
Int. Cl. H04b 1/04
U.S. Cl. 325—121 **1 Claim**

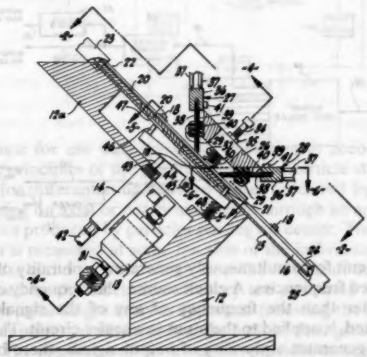


The low power RF injection pulses of an injection-locked pulsed magnetron are phase controlled in coded sequence to provide high power phase coded coherent RF output pulses. The magnetron transmits pulses having identical phase patterns as those of the injected signals. Complex coding is achieved by multiple alternate 180° phase shifts and by varying degrees of phase shifts within individual pulses.

3,701,021
APPARATUS FOR TESTING CIRCUIT PACKAGES

George L. Isaac, Sunnyvale; Richard F. Kingsbury, San Jose, and John G. Surak, Los Gatos, all of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Nov. 27, 1970, Ser. No. 93,322
Int. Cl. G01r 31/22; B07c 5/344
U.S. Cl. 324—158 F **7 Claims**

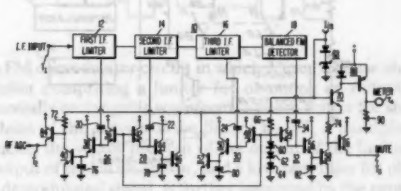


Apparatus for testing circuit packages including a test sequence generator which is connected to a contactor for making contact to the leads of a circuit package. The contactor includes an inclined track for slidably receiving integrated circuit packages, and circuit package storage tubes connected to the ends of the inclined track. The contactor has a test region at which a circuit package is held by a rocker member. Contact means having a plurality of fingers is operated to make contact with the leads of an integrated circuit package in the test region. A test sequence may then be conducted. After the test sequence the rocker member is operated to release the integrated circuit package which has just been tested from the test region. Another circuit package then moves into the test region and the testing sequence is initiated again.

3,701,022
PEAK-TO-PEAK DETECTOR

Jack Craft, Somerville, N.J., assignor to RCA Corporation

Filed June 8, 1971, Ser. No. 151,115
Int. Cl. G01r 19/04; H02m 7/24; H04b 1/16
U.S. Cl. 325—318 **10 Claims**

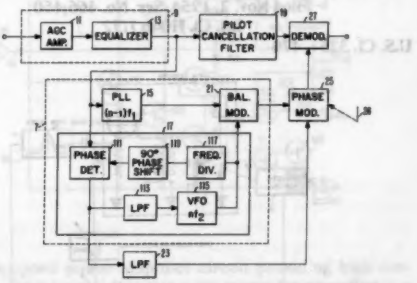


Peak-to-peak signal detection apparatus adapted for construction in monolithic integrated circuit form. The base-emitter junctions of three like conductivity transistors are direct current coupled in cascade across a source of forward bias voltage (e.g., $3V_{BE}$). Signals to be detected are capacitively coupled to the junction of the base of the second and the emitter of the first transistors. A detector filter capacitor is connected across the base-emitter of the third transistor. Peak-to-peak detected signals are provided at the output of the third transistor.

3,701,023
PHASE JITTER EXTRACTION METHOD FOR DATA TRANSMISSION SYSTEMS

Yang Fang, Clarksburg, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 29, 1971, Ser. No. 157,908
Int. Cl. H04b 1/10, 1/16, 1/68
U.S. Cl. 325—329 **7 Claims**



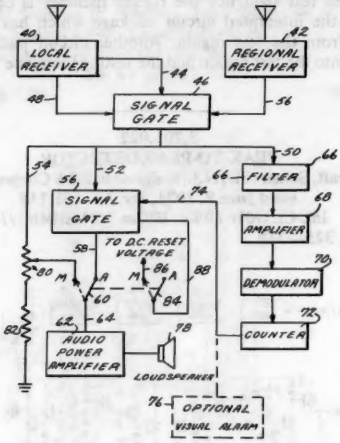
A carrier recovery method and apparatus for generating a carrier having the proper frequency, relative phase and phase jitter to accurately demodulate a modulated signal having phase jitter. The phase jitter is detected with minimal distortion and modulated onto a carrier signal generated by means of phase locked oscillators.

3,701,024

LOCAL AND NATIONAL WARNING ALARM SYSTEM

James H. Knowles, Rt. 3, Box 49, Jackson, Miss.; Billie Joe Ball, P.O. BOX 2848, and Donald F. Fitzgerald, P.O. Box 791, both of State College, Miss.

Filed Dec. 30, 1970, Ser. No. 102,844
Int. Cl. H04b 1/16
U.S. Cl. 325—364 **7 Claims**



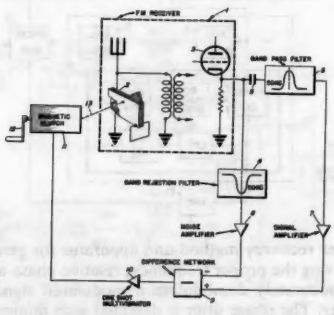
An alarm and information communication system utilizing existing radio broadcast facilities to transmit a warning alarm signal and emergency information to the population in the event of a local or national emergency; the system consists of a warning alarm signal generator as an available program source at the broadcast stations and warning alarm signal and emergency information receivers are provided for use by the general public. The system provides for designation of some radio broadcast stations as "local stations" and some as "regional stations" by Civil Defense or other appropriate authority; each alarm signal and information receiver is adapted to continuously monitor one local and one regional broadcast station whereby, upon reception of a signal of a specified frequency from the local station or reception of a signal from the regional station, the receiver will emit an alarm signal and then broadcast the pertinent information.

3,701,025

SELECTIVE SIGNAL TUNING DEVICE

Nelson D. Foley, North Little Rock, Ark., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 2, 1954, Ser. No. 466,460
Int. Cl. H04b 1/32
U.S. Cl. 325—470 **2 Claims**



A receiver control apparatus is disclosed for locating an emitted signal by utilizing an automatic tuning means with a mechanical clutch mechanism will release the receiver tuning means after the frequency has been found.

ERRATUM

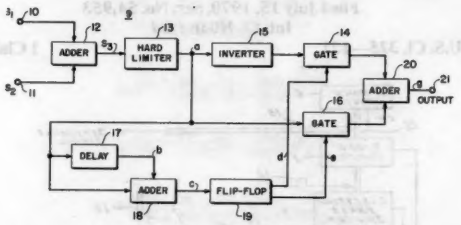
For Class 328—63 see:
Patent No. 3,700,931

3,701,026

MEDIAN FREQUENCY GENERATOR

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed May 13, 1971, Ser. No. 142,963
Int. Cl. H03b 19/00
U.S. Cl. 328—15 **3 Claims**



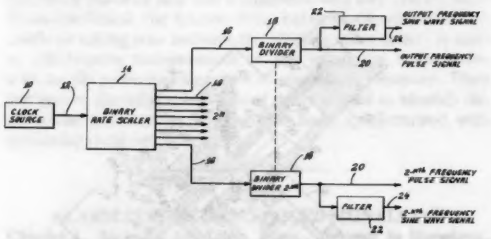
The median frequency generator linearly adds two input signals having the same amplitude to obtain a third signal having a frequency equal to the median of the frequencies of the two input signals, an amplitude which varies with time, and a phase which reverses at a frequency equal to the difference in the frequencies of the input signals. Timing pulses are generated by a flip-flop in synchronism with the phase reversals and are used as gating signals to invert the phase reversed portions of the third signal to produce the median frequency output signal.

3,701,027

DIGITAL FREQUENCY SYNTHESIZER

John Price Belton, Jr., Columbia, Md., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed April 15, 1971, Ser. No. 134,296
Int. Cl. H03b 19/00
U.S. Cl. 328—17 **7 Claims**



A circuit for simultaneously generating a plurality of signals at related frequencies. A clock source, the frequency of which is greater than the frequency of any of the signals to be generated, is applied to the input to a scaler circuit. The scaler circuit generates a plurality of output signals, there being an output signal from the scaler circuit corresponding to each of the related frequency signals to be generated. At least some of the signals from the scaler have non-uniform pulse-to-pulse

spacing. The outputs from the scaler circuit are then converted into signals at the desired frequencies with substantially uniform pulse-to-pulse spacing. For the preferred embodiment of the invention, this is accomplished by scaling the signals from the scaler circuit at frequencies which are multiples of the corresponding signals of related frequencies and then dividing down each signal from the scaler to obtain the desired signals.

3,701,028

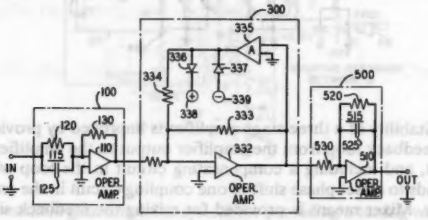
REDUCTION OF HARMONIC DISTORTION

John Anthony Markevich, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 13, 1971, Ser. No. 162,129

Int. Cl. H03b 1/04

U.S. Cl. 328—167 **4 Claims**



Harmonic distortion generated in signal processors is reduced by pre-emphasizing the processor input signal and de-emphasizing the processor output signal.

3,701,029

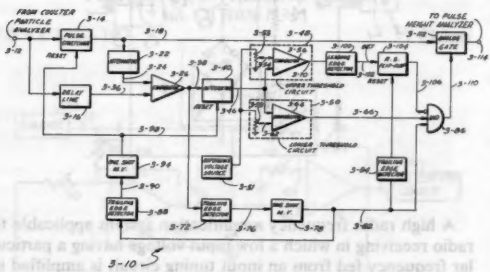
AXIAL TRAJECTORY SENSOR HAVING GATING MEANS CONTROLLED BY PULSE DURATION MEASURING

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Oct. 27, 1970, Ser. No. 84,440

Int. Cl. H03k 17/02, 5/20

U.S. Cl. 328—91 **33 Claims**



A sensor for use with apparatus operating in accordance with the principles of the Coulter electronic particle studying device, for differentiating between pulses produced by particles passing on axial or nearly axial paths through an aperture and pulses produced by particles passing off center. The pulse duration is measured at some fraction of the individual pulse amplitudes and only those which meet the criteria of duration established by the electronic circuitry are permitted to pass for use in pulse height analysis apparatus following the sensor. The other pulses are discarded on the basis of their greater durations. The apparatus of the invention provides structure for deriving a duration-measuring pulse whose duration is that of the particle pulse at its fractional amplitude, converting the signal into one which has an amplitude proportional to duration, and then subjecting the latter signal to the criteria of duration established as amplitude levels to operate gating means automatically for rejecting the longer duration pulses and passing the shorter duration pulses.

3,701,030

FM DEMODULATOR CIRCUIT USING PHASE-SHIFTING MULTIPLIER

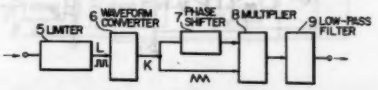
Yukisato Gocho, Yamato, and Takahiro Inokuchi, Tokyo, both of Japan, assignors to Tokyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Sept. 20, 1971, Ser. No. 181,908

Claims priority, application Japan, Sept. 22, 1970, 45/83095

Int. Cl. H03d 3/00

U.S. Cl. 329—134 **3 Claims**



An FM demodulator circuit in which is used a phase-shifting multiplier comprising a limiter for obtaining an output of a substantially rectangular waveform, a phase shifter for shifting the phase of the output of the limiter by 90°, a multiplier for producing the vector product of the output of the limiter and the output of the phase shifter, and a low-pass filter for obtaining a demodulated signal, is further improved by the provision of a waveform converter for converting the rectangular waveform into a substantially triangular waveform, between the limiter and the phase shifter, so that a reference signal for the multiplier is thereby made to assume a substantially triangular waveform.

3,701,031

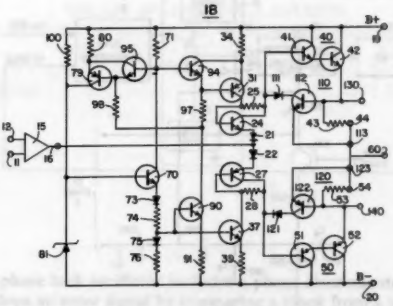
COMPLEMENTARY POWER AMPLIFIER

Thomas M. Frederiksen, Scottsdale, and Ernest L. Long, Tempe, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 26, 1970, Ser. No. 66,924

Int. Cl. H03f 3/18

U.S. Cl. 330—17 **27 Claims**



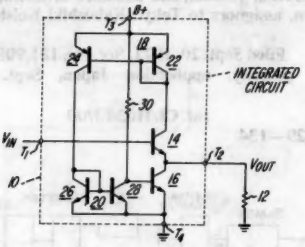
An integrated power amplifier circuit providing high current gain and substantially unity voltage gain for operating as a current boost amplifier includes temperature stabilized current sources operated from a stabilized voltage supply to cause the operation of the amplifier to be independent of supply voltage and temperature variations. In addition, protection against reverse current flow and output current limiting of the output stage is provided.

3,701,032

ELECTRONIC SIGNAL AMPLIFIER

Steven Alan Steckler, Clark, N.J., assignor to RCA Corporation

Filed Feb. 16, 1971, Ser. No. 115,472
Int. Cl. H03f 3/42
U.S. Cl. 330—18 15 Claims



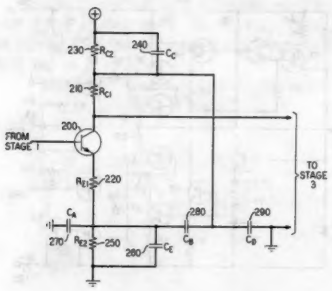
Semiconductor voltage follower arrangements adapted for construction in integrated circuit form. A load circuit is coupled to the emitter of a voltage follower transistor. Operating potential is supplied to the collector of the follower transistor via the base-emitter circuit of a second transistor arranged in a common emitter transistor. The collector-emitter circuit of a regulator transistor is coupled across the load circuit. Feedback is provided from the output of the common emitter transistor to the input of the regulator transistor such that the collector current of the follower transistor is substantially independent of input voltage variations applied to the base of the follower transistor.

3,701,033

BROADBAND AMPLIFIER HAVING IMPROVED GAIN CHARACTERISTICS

Gerard White, Marlboro, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 2, 1970, Ser. No. 94,451
Int. Cl. H03f 3/04
U.S. Cl. 330—21 5 Claims



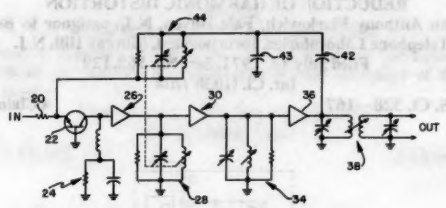
A broadband amplifier including a high-frequency amplifier embedded in a low-frequency circuit is described. The broadband amplifier is characterized by a flat gain response from direct current (d.c.) to the high-frequency cutoff of the unmodified high-frequency amplifier configuration. Further, the broadband amplifier provides this low- and high-frequency gain without compromise to the high-frequency response characteristic of prior art circuits.

3,701,034

EQUALIZER CIRCUIT FOR MULTISTAGE FEEDBACK AMPLIFIER

Warren B. Bruene, Dallas, Tex., assignor to Collins Radio Company, Dallas, Tex.

Filed March 23, 1971, Ser. No. 127,214
Int. Cl. H03f 1/08
U.S. Cl. 330—28 8 Claims



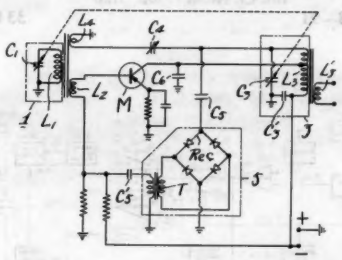
Stability of a three stage amplifier is improved by providing a feedback loop from the amplifier output to the amplifier input, and including a compensating circuit in the loop which tends to offset phase shift of one coupling circuit in the amplifier. Mixer means is provided for mixing the feedback signal with the input signal.

3,701,035

HIGH FREQUENCY AMPLIFICATION SYSTEM

Toichi Chikuma, Kawagoe, Japan, assignor to Girling Limited, Birmingham, England

Filed Oct. 9, 1970, Ser. No. 79,567
Int. Cl. H03f 3/04
U.S. Cl. 330—31 1 Claim

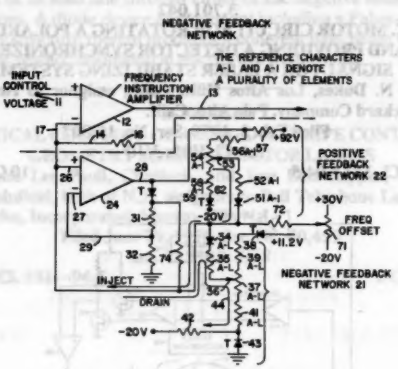


A high radio frequency amplification system applicable to radio receiving in which a low input voltage having a particular frequency fed from an input tuning circuit is amplified in amplifier to provide an output signal voltage having the same frequency as that of the said input signal voltage, a portion of said output signal voltage is fed back to said amplifier, another portion of the rest of said output signal voltage is fed back to said amplifier after doubling the frequency of the second portion of signal voltage whereby said low input voltage having the particular frequency, said fedback voltage having the same frequency as that of the input voltage and constituting a portion of said output voltage and a voltage constituting another portion of the rest of said output voltage and having a frequency two times as high as that of the first-mentioned two types of voltage are mixed together in said mixing amplifier so as to obtain a high output voltage having the same frequency as that of said input voltage.

3,701,036
VARIABLE GAIN AMPLIFIER SYSTEM

Rudy S. Stefenel, San Jose, Calif., assignor to Wiltron Company, Palo Alto, Calif.

Filed Sept. 28, 1970, Ser. No. 76,187
Int. Cl. H03f 1/36
U.S. Cl. 330—85 7 Claims

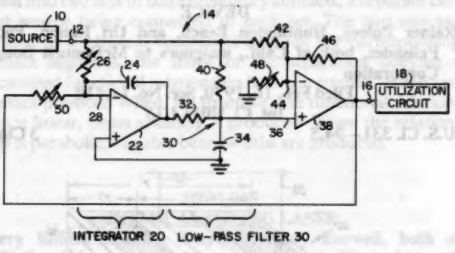


A variable gain amplifier system for providing a tuning voltage to a radio frequency oscillator to linearize its voltage to output frequency characteristic includes an operational amplifier where the feedback loop which controls the gain of the amplifier is coupled to both positive and negative feedback networks. The positive feedback network consists of several diode-resistor legs which inject current into the feedback loop at different input control voltage levels to thus vary the gain of the amplifier. Similarly a negative feedback network consists of several diode-resistor legs which drain current from the amplifier feedback loop at various levels of the input control voltage to increase gain.

3,701,037
ACTIVE FILTER

Jerry L. Holsinger, Lexington, Mass., assignor to Intertel, Inc., Burlington, Mass.

Filed June 24, 1971, Ser. No. 156,380
Int. Cl. H03f 1/36
U.S. Cl. 330—107 7 Claims

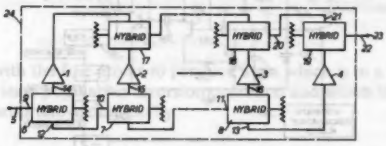


An active filter circuit. Two cascaded phase shift networks are in circuit with the non-inverting input terminal of an operational amplifier. A resistive feedback network couples the amplifier output back to the first of the phase shift networks. When an external input signal is applied to both phase shift networks and the inverting input terminal of the amplifier, the filter circuit has a pass band and a stop band. Inputs to any single one of these points selectably provide high-pass, low-pass and band-pass operation.

3,701,038
PARALLEL AMPLIFIERS WITH INPUT AND OUTPUT SEQUENCES OF HYBRIDS

Boleslaw Marina Sosin, Chelmsford, England, assignor to The Marconi Company, London, England

Filed Dec. 14, 1970, Ser. No. 97,953
Claims priority, application Great Britain, Dec. 19, 1969, 62,152/69
Int. Cl. H03f 3/68
U.S. Cl. 330—124 R 5 Claims

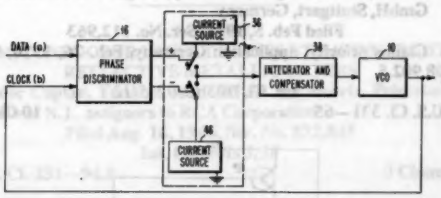


An amplifier arrangement for operating at least 3 amplifiers in parallel includes a first and second sequence of hybrids, there being one less hybrid in each sequence than there are amplifiers. The first sequence of hybrids have one output connected to an amplifier and the other output connected to the input of the following hybrid, except the last hybrid in the sequence which has its other output connected to the last amplifier input. The second sequence of hybrids have two inputs, one from an associated amplifier and another from the preceding hybrid, except the first hybrid in the second sequence which has both inputs supplied from amplifiers.

3,701,039
RANDOM BINARY DATA SIGNAL FREQUENCY AND PHASE COMPENSATION CIRCUIT

Paul C. Lang; Anthony N. La Pine, both of San Jose, and Julian E. Vaughn, Campbell, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1968, Ser. No. 771,205
Int. Cl. H03b 3/04
U.S. Cl. 331—1 A 2 Claims

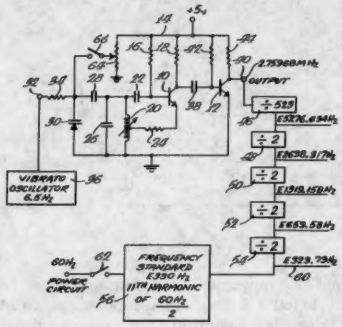


A phase lock oscillator includes a phase discriminator that develops an error signal by comparing a clock from a voltage controlled oscillator with incoming random data bits. In the absence of data, the phase lock oscillator is inactive. However, when data is sensed, a logic and delay network in the phase discriminator develops an error voltage of suitable polarity and amplitude, indicative of the lead or lag between the data and clock signals. The error voltage is applied to the voltage controlled oscillator to modify the frequency and phase of the clock. Furthermore, first and second integrations are provided by the phase discriminator and an integrator respectively so that the steady state phase error is held close to zero.

3,701,040
ELECTRONIC MUSICAL INSTRUMENT MASTER OSCILLATOR WITH PROVISION FOR FREQUENCY CONTROL

Alexander J. Borrevik, Babylon, N.Y., and Charles J. Tennes, Palatine, Ill., assignors to Hammond Corporation, Deerfield, Ill.

Filed Jan. 11, 1971, Ser. No. 105,309
Int. Cl. G10h 5/06; H03b 3/04, 23/00
U.S. Cl. 331—44 **5 Claims**

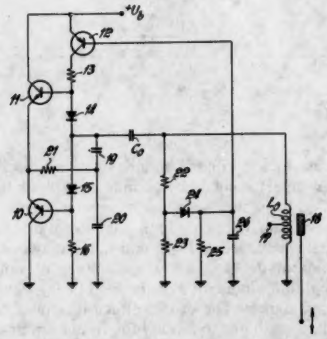


A master oscillator operating in the MHz range for supplying a signal suitable for providing the notes of the musical scale, the various note signals being arrived at by frequency division of the master frequency. The oscillator has a high order of frequency stability together with ease of control for shifting the frequency to supply vibrato, portamento, trill, transposition features and the like. Control is exercised by incorporating a voltage-variable capacitance diode, "Varicap," as an effective element in the oscillator tank and varying the diode bias. Features provide for isolation of the bias voltage from the main tank circuit, a zero-bias condition at the true frequency, and a novel comparison tuning system using a slightly off-pitch tuning reference standard for obtaining true pitch.

3,701,041
AMPLITUDE STABILIZED COMPLEMENTARY TRANSISTOR OSCILLATOR

Karl-Heinz Adler; Helmut Domann Leonberg, and Johannes Locher, all of Stuttgart, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 5, 1971, Ser. No. 112,963
Claims priority, application Germany, Feb. 26, 1970, P 20 08 902.5
Int. Cl. H03b 3/02, 5/12
U.S. Cl. 331—65 **10 Claims**

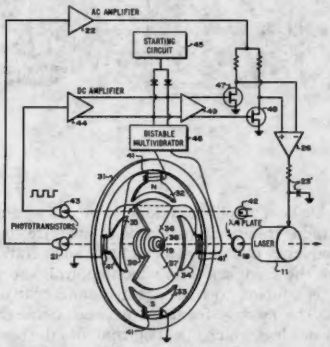


Part of the output of a push pull Clapp oscillator is rectified and smoothed to provide a voltage for stabilizing the oscillation amplitude, the control voltage being fed to the base of a transistor that acts as a variable resistance in a voltage divider connected to the bases of the push pull oscillator transistors, the controlled conduction of the voltage divider transistor acting to control the working points of the oscillator transistors so as to maintain a substantially constant oscillation amplitude.

3,701,042
D. C. MOTOR CIRCUIT FOR ROTATING A POLARIZER AND PROVIDING A DETECTOR SYNCHRONIZER SIGNAL FOR A LASER STABILIZING SYSTEM

John N. Dukes, Los Altos Hills, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 3, 1970, Ser. No. 15,802
Int. Cl. H01s 3/10
U.S. Cl. 331—94.5 **10 Claims**

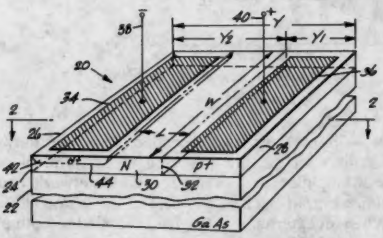


A stabilizing circuit for a two frequency laser wherein the two modes of oscillation of the laser are converted by a quarter wave plate and a rotating polarizer into two separate components, the difference in intensity of these components serving to produce an error signal from a detector circuit synchronized with the rotating polarizer, the error signal controlling a piezoelectric transducer coupled to the cavity resonator of the laser to tune the laser. A brushless D.C. motor serves to rotate the polarizer and at the same time provide the synchronizing signals to the detector circuit.

3,701,043
NEGATIVE RESISTANCE LIGHT EMITTING DIODE DEVICE

Rainer Zuleeg, Huntington Beach, and Uri Ranon, Pacific Palisades, both of Calif., assignors to McDonnell Douglas Corporation

Filed Feb. 16, 1970, Ser. No. 11,410
Int. Cl. H01s 3/18
U.S. Cl. 331—94.5 **3 Claims**



Diode device comprising a light emitting diode fabricated of a semiconductor having bulk negative resistance properties.

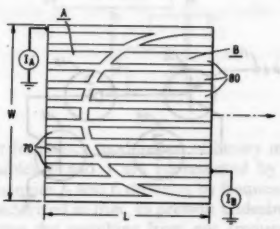
The diode includes a light emitting P^+N junction and a N-type layer or section of predetermined resistivity and geometry. The diode device has a voltage-current characteristic including two current-controlled, negative resistance portions separated by a region wherein the device is unstable and produces free oscillations which are in phase with intensity variations simultaneously produced in the emitted light. Bistable operation of the device can be obtained by suitable placement of its load line through either of the negative resistance portions. A diode device embodiment including a Fabry-Perot cavity structure therein produces a coherent light beam which can be readily modulated at microwave frequencies.

3,701,044

OPTICAL COUPLING OF ADJACENT STRIPE CONTACT GEOMETRY SEMICONDUCTOR LASERS

Thomas Lee Paoli, Chatham, and Jose Ellis Ripper, North Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 29, 1970, Ser. No. 50,459
Int. Cl. H01s *3/18*
U.S. Cl. 331—94.5 **2 Claims**



Adjacent stripe contact geometry semiconductor lasers are optically coupled if the stripe contacts are sufficiently close that the optical fields of adjacent lasers overlap; i.e., the field of one laser penetrates the active region of adjacent lasers and/or the fields of adjacent lasers mutually interact in the lossy region between lasers. In the case of two such coupled lasers, the combination oscillates at some frequency intermediate the natural frequencies of oscillation of the two lasers taken separately. Also disclosed are several embodiments employing a plurality of parallel stripe contacts electrically divided into two sets of complementary contacts, a separate current source being connected to each set. The two sets are formed by a physical separation between the corresponding contact segments, the shape of the separation obeying a prescribed functional relationship between contact length and contact position. When, for example, the functional relationship is linear, beam scanning is produced. When the relationship is parabolic, variable beam widths are produced.

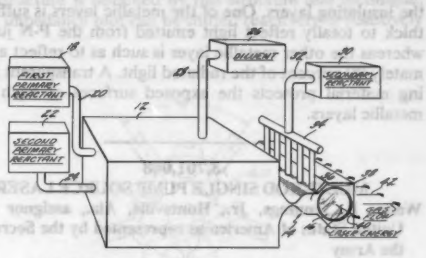
3,701,045

CHEMICAL MIXING LASER

Barry Robert Bronfin; Wayne Gregory Burwell, both of Wethersfield, and Richard August Meinzer, Glastonbury, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 23, 1970, Ser. No. 83,432
Int. Cl. H01s *3/22, 3/09*
U.S. Cl. 331—94.5 **20 Claims**

Primary reactants in nonstoichiometric proportions interact chemically in a reaction chamber to produce a high temperature, high pressure gas containing a substantial percentage of free atoms. Aerodynamic expansion of the gas effluent from the reaction chamber preserves the free atoms in an unrecombined condition. A secondary reactant is admixed with the main gas stream after the expansion process and reacts chemically with the free atoms to produce a gas which is in a vibrational state population inversion condition and which lases in an appropriate optical cavity.

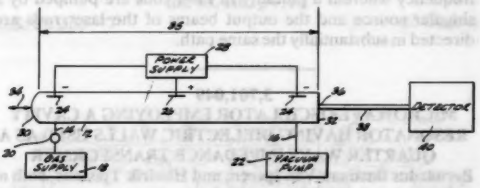


3,701,046

GAS LASER MATERIALS AND SYSTEM THEREFOR

Oscar M. Stafsudd, and Frederik A. Haak, both of Boston, Mass., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 734,778, June 5, 1968, abandoned.
This application March 5, 1971, Ser. No. 121,586
Int. Cl. H01s *3/22*
U.S. Cl. 331—94.5 **32 Claims**



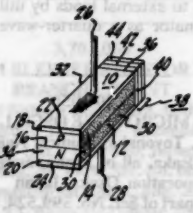
The present invention provides gas laser materials and a laser system utilizing them to produce laser emissions in the far infrared region between 300 microns and 1,000 microns. Specific materials are selected from the methane and ethane group useful in combination with nitrogen to provide active laser media.

3,701,047

SEMICONDUCTOR LASER DEVICES UTILIZING LIGHT REFLECTIVE METALLIC LAYERS

Sandor Caplan, Trenton, and Michael F. Lamorte, Princeton, both of N.J., assignors to RCA Corporation

Filed Aug. 16, 1966, Ser. No. 572,845
Int. Cl. H01s *3/18*
U.S. Cl. 331—94.5 **3 Claims**



A P-N junction semiconductor laser diode in which light reflective metallic layers are provided on the optically flat op-

posed surfaces of the diode. A transparent insulating coating having a particular thickness covers each of the semiconductor end surfaces. A thin metallic layer is disposed on each of the insulating layers. One of the metallic layers is sufficiently thick to totally reflect light emitted from the P-N junction, whereas the other metallic layer is such as to reflect approximately 99 percent of the radiated light. A transparent insulating material protects the exposed surfaces of each of the metallic layers.

3,701,048

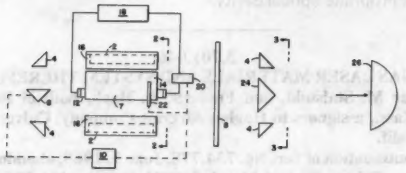
MULTI-ROD SINGLE PUMP SOURCE LASER

Walter B. Jennings, Jr., Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army

Filed Sept. 15, 1967, Ser. No. 668,246

Int. Cl. H01s *3/09*

U.S. Cl. 331—94.5 **2 Claims**



A device for achieving laser output at a high repetition frequency wherein a plurality of laser rods are pumped by a singular source and the output beams of the laser rods are directed in substantially the same path.

3,701,049

MICROWAVE OSCILLATOR EMPLOYING A CAVITY RESONATOR HAVING DIELECTRIC WALLS USED AS A QUARTER WAVE IMPEDANCE TRANSFORMER

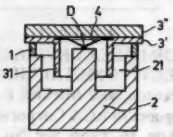
Bernardus Bastiaan Van Iperen, and Hindrik Tjassens, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 21, 1970, Ser. No. 82,766

Claims priority, application Netherlands, Oct. 25, 1969, 6916126

Int. Cl. H03b *5/12, 5/24*

U.S. Cl. 331—107 R **7 Claims**



A microwave oscillator comprising a semiconductor device employed in a cavity resonator having dielectric walls. The cavity is matched to external loads by utilizing the dielectric walls of the resonator as a quarter-wave impedance transformer.

3,701,050

SOLID STATE MICROWAVE OSCILLATING DEVICE

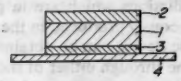
Hiroyuki Mizuno, Toyonaka; Shinichi Nakashima, Suita, and Yukio Miyai, Osaka, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 599,524, Dec. 6, 1966. This application April 21, 1971, Ser. No. 135,867

Int. Cl. H03b *7/06*

U.S. Cl. 331—107 R **3 Claims**

The present invention provides a device for producing microwave oscillations which generally comprises a solid state oscillating element and a cavity resonator, said element comprising a semiconductor substrate with a metal layer thereon and a rectifying junction formed therebetween. An electric



potential is impressed on the depletion layer of the rectifying junction in the backward direction, thus producing microwave oscillations.

3,701,051

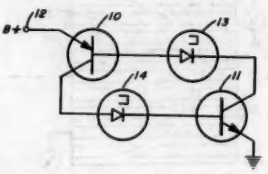
STABLE OSCILLATOR

Dudley V. Simms, 14 Civic Center Drive, East Brunswick, N.J.

Filed July 28, 1971, Ser. No. 166,788

Int. Cl. H03b *7/08*

U.S. Cl. 331—107 T **5 Claims**



A configuration of complementary transistors and a pair of matched tunnel diodes forming a stable, sinusoidal oscillator.

3,701,052

METHOD OF AMPLITUDE CONTROL OF ELECTROMECHANICAL OSCILLATORS

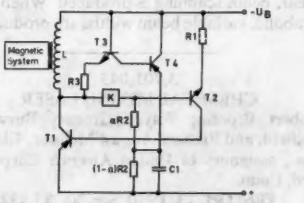
Hans Keller, Freiburg, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed July 15, 1971, Ser. No. 162,882

Claims priority, application Germany, July 22, 1970, P 20 36 330.8

Int. Cl. H03b *5/36*

U.S. Cl. 331—116 M **4 Claims**



This is a method and circuit for controlling electromechanical oscillators in electronic watches which are excited by a circuit containing only one driving coil. The voltage which is induced in the coil by the oscillator is used as a measure for controlling the width of the exciting pulse.

3,701,053

PROCESS AND APPARATUS FOR TRANSMISSION OF BINARY MESSAGES BY SYNCHRONIZED FREQUENCY SHIFT KEYING

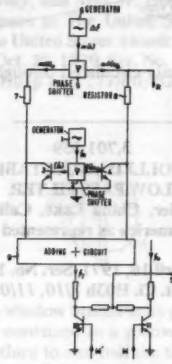
Jean-Marie de Rubinat, Mont-sur-Marchienne, Belgium, assignor to Ateliers de Constructions Electriques de Charleroi (ACEC), Charleroi, Belgium

Filed March 17, 1971, Ser. No. 125,307

Claims priority, application Belgium, March 18, 1970, 86557

Int. Cl. H04l 27/12

U.S. Cl. 332—9 T 2 Claims



A process for frequency modulation of binary messages in which the variables 0 and 1 are represented by signals of respective frequencies f_0 and f_1 differing by frequency Δf. The process is characterized in that, to prevent undesirable phase modulation during the switching from one frequency to the other, frequency f_1 is related to frequency f_0 by deriving the signal of frequency f_1 from a carrier wave form at the frequency f_0 through modulation of such frequency f_0 to obtain a single sideband by means of a signal of frequency Δf which determines the rate of the switching intervals of the binary message. The apparatus comprises a first generator providing a carrier wave form of frequency f_0, a first phase shifting circuit providing two first signals of frequency f_0 shifted by 90°, a second generator providing a signal of frequency Δf, a second phase shifting circuit providing two second signals phased 90° from each other, two modulators for amplitude modulating the two first signals by the two second signals respectively, an adding circuit for adding the outputs of said two modulators and having means for suppressing one of the sidebands and the carrier waveform so as to generate a signal of frequency f_1, an electronic switching means operated at the frequency Δf or a submultiple thereof for switching the signals of frequencies f_0 and f_1 in accordance with the message to be transmitted.

3,701,054

IMPEDANCE MATCHING STRUCTURE HAVING REDUCED PORTIONS OF TRANSMISSION LINES CONNECTED TO OFFSET STRIPLINE CENTER CONDUCTORS WITH STRIP GUIDES CONNECTING SAID CENTER CONDUCTORS

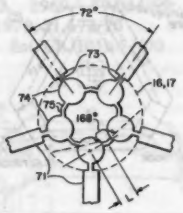
Thomas A. Hagler, and William C. Heithaus, both of Clearwater, Fla., assignors to The United States of America as represented by the Secretary of the Army

Filed Nov. 4, 1969, Ser. No. 873,874

Int. Cl. H01p 1/32, 5/12

U.S. Cl. 333—1.1 1 Claim

This invention relates to an impedance matching structure and technique that is particularly useful in junction circulators. The improved impedance match between the circulator junction and a strip transmission line, for example, is accomplished by abruptly reducing the size of the transmission line that is under the conventional ferrite puck or disk structure by a factor of approximately four. A broadband impedance match structure is obtained by this structure and technique, and the impedance plot can be shifted reactively or resistively



by: (1) varying the strip width of the transmission line under the puck, or (2) varying the amount that the ferrite puck overlaps the full-width portion of the transmission line, or (3) varying the length of the reduced width transmission line.

3,701,055

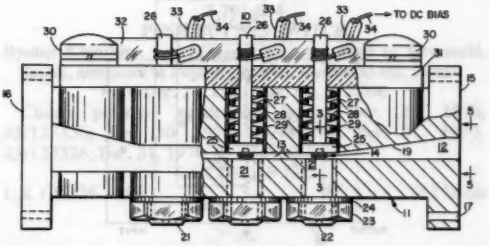
KA-BAND SOLID-STATE SWITCHING CIRCUIT

Charles W. Stiles, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 26, 1972, Ser. No. 220,998

Int. Cl. H01p 1/10

U.S. Cl. 333—7 13 Claims



A solid-state switching circuit for use in the Ka frequency band is disclosed wherein a body casting which a waveguide passageway therethrough includes one or more packaged PIN diodes in shunt across a reduced height portion of said waveguide. A quarter wavelength bias rod engages the PIN diode package at one terminal and a tuning screw engages the PIN diode package at the other terminal, the tuning screw being turnable into and out of the waveguide.

3,701,056

RESISTIVE FILM BLEEDER RESISTOR FOR USE IN AN BRANCH CIRCUIT

Syuichi Ozawa, and Noboru Tomimura, both of Tokyo, Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha (a/k/a Iwatsu Electric Co., Ltd.), Tokyo-to, Japan

Filed Aug. 24, 1970, Ser. No. 66,292

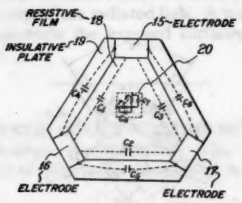
Claims priority, application Japan, Aug. 25, 1969, 44/66626

Int. Cl. H01p 1/22; H01c 7/00

U.S. Cl. 333—8 5 Claims

A bleeder resistor used in a branch circuit for dividing a high frequency electric power into a plurality of parts, in which three electrodes are disposed at vertex corners of a regular triangle on an insulative plate, and in which a resistive

film is deposited on the surface of the insulative plate so as to be connected to all the three electrodes so that a resistance



between any two of the three electrodes is substantially equal to a desired value in a wide frequency range.

3,701,057

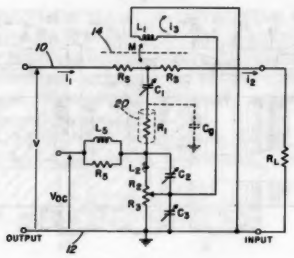
BROAD-BAND LUMPED-ELEMENT DIRECTIONAL COUPLER

Cletus A. Hoer, Boulder, Colo., assignor to The United States of America as represented by the Secretary of the Navy

Filed May 20, 1971, Ser. No. 145,153

Int. Cl. H01p 5/14

U.S. Cl. 333—10 **10 Claims**



A broad-band lumped element directional coupler for measuring either the forward or reflected power in a coaxial transmission line. A resistive voltage divider is coupled to the center conductor of a transmission line with a capacitor to keep the phase of the voltage sampling circuit equal to the phase of the current sampling circuit. Capacitors shunting the resistors make the voltage ratio of the resistive voltage divider independent of frequency over a large frequency range. Directivity greater than 50 dB is achieved over a large frequency range for coupling ratios of 30, 40 and 50 dB.

3,701,058

FLUIDIC PHASE SHIFTER

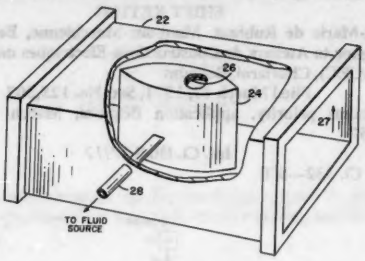
Bob L. Smith, 442 Judith Lane, Apt. 5B, Huntsville, Ala.

Continuation-in-part of Ser. No. 23,120, March 27, 1970, abandoned. This application June 3, 1971, Ser. No. 149,418

Int. Cl. H03h 7/36

U.S. Cl. 333—31 A **4 Claims**

Apparatus including an expandable dielectric container and dielectric fluid therein disposed in a waveguide for propagating electromagnetic waves to change the phase thereof. The fluid may be introduced slowly or rapidly into the waveguide



or may be continuously circulated through the waveguide to provide cooling.

3,701,059

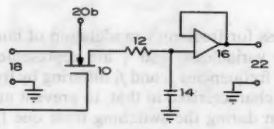
REMOTE CONTROLLED, ADJUSTABLE BANDWIDTH LOW PASS FILTER

Reuben E. Nyswander, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 16, 1971, Ser. No. 134,777

Int. Cl. H03h 7/10, 11/00

U.S. Cl. 333—70 A **4 Claims**



A bandwidth controlled, low pass filter circuit having a resistor, capacitor, voltage follower amplifier, and an insulated gate, metallic oxide semiconductor, field effect transistor utilized as a switch, in which the transistor and the resistor, together, provide the effective circuit filter resistance, and the bandwidth is controlled by the transistor gate pulse frequency and pulse width. The use of several such filters as a filter bank is also disclosed.

3,701,060

HELICAL WAVEGUIDE

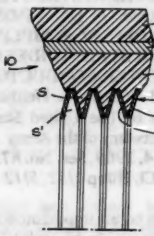
Antonio Ferrentino, Monza, Italy, assignor to Industrie Pirelli Societa per Azioni, Milan, Italy

Filed Aug. 31, 1971, Ser. No. 176,499

Claims priority, application Italy, Feb. 17, 1971, 20647 A/71

Int. Cl. H01p 3/14

U.S. Cl. 333—95 A **8 Claims**



A waveguide having an internal wall formed by a plurality of insulated straps of conductive material wound on edge in a

helix so that the major surfaces thereof face each other, each strap being of a different cross-section or being differently disposed so as to leave a space between adjacent major surfaces. The helix is covered by a sheath of flexible insulating material which may be covered by an armor which, in turn, may be covered by a protective layer of flexible insulating material.

3,701,061

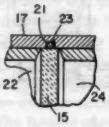
RADIOFREQUENCY WINDOW ASSEMBLY HAVING SHIELDED SOLDER JOINTS AND REWELDABLE REPLACEMENT FLANGES

William A. Novajovsky, and Max W. Hoelscher, both of Lancaster, Pa., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 20, 1970, Ser. No. 82,379

Int. Cl. H01p *1/08*, *11/00*; B23k *31/02*

U.S. Cl. 333—98 P **6 Claims**



A radiofrequency window brazed at its periphery to a sleeve by means of solder contained in a groove in the sleeve. The groove is from one-third to one-half the thickness of the window and the diameter of the window is equal to the inside diameter of the sleeve. To provide a shielded solder joint without fillets or voids, the window is held in place during brazing with a pair of snap rings having bevelled faces held against the edges of the window to ensure that solder does not run beyond the edges of the window. The sleeve is mounted within a pair of supporting rings having a pair of truncated conical flanges attached at opposite ends for welding at their outer edges with similar truncated conical flanges attached to respective waveguide flanges. The conical flanges may be cut and rewelded near their outer edges for convenient removal and replacement of the window assembly in a waveguide system.

3,701,062

ELECTROMAGNETIC RELAY

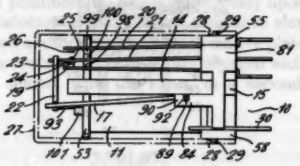
Hirohumi Koga, and Ryuichi Sato, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed May 20, 1971, Ser. No. 145,380

Claims priority, application Japan, May 26, 1970, 45/45822; Sept. 9, 1970, 45/80118

Int. Cl. H01h *51/06*

U.S. Cl. 335—135 **15 Claims**



An electromagnetic relay including a spool member having a base with recesses in opposite sides, a flange, and a stem portion connecting the base and flange. The stem portion surrounds the core, a coil is wound on the stem portion. The armature is disposed generally parallel with the core. A plug member is adapted to be fitted into the recesses in the spool base to hold the armature.

3,701,063

TEMPERATURE RESPONSIVE ELECTRIC CONTROL DEVICE

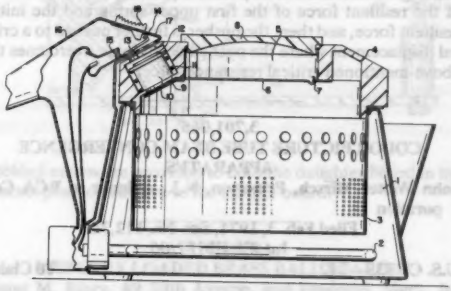
Georges Jean Louis-Marie Clausse, Laleham, England, assignor to The Hoover Company, North Canton, Ohio

Filed Oct. 9, 1970, Ser. No. 79,568

Claims priority, application Great Britain, Oct. 9, 1969, 49,708/69; Dec. 3, 1969, 59,044/69; Dec. 17, 1969, 61,560/69; May 5, 1970, 21,672/70

Int. Cl. H01h *51/00*

U.S. Cl. 335—146 **8 Claims**



A temperature responsive electric control device has electric contacts, a body of thermo-magnetic material, and a magnet movable between two positions in the first of which it is held by magnetic attraction with the body while this body is at a temperature below its Curie point, and in the second of which it operates by magnetic attraction to actuate the contacts.

3,701,064

PUSH-BUTTON SWITCH

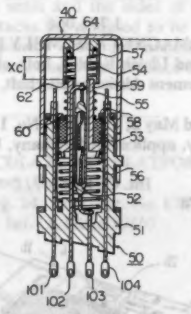
Ryohei Kinoshita, and Masami Ishizawa, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki-shi, Japan

Filed Dec. 27, 1971, Ser. No. 212,096

Claims priority, application Japan, Dec. 29, 1970, 45/133336; Dec. 30, 1970, 45/123070; Dec. 31, 1970, 45/123326; Dec. 31, 1970, 45/134737

Int. Cl. H01h *5/02*

U.S. Cl. 335—205 **10 Claims**



This disclosure relates to a push-button switch comprising a housing provided with a support means for supporting a magnetic member, a reed switch element fixedly and vertically positioned in the housing, a lower spring contained in the housing, a magnet mounted on the lower spring which is capable of moving up and down with respect to the reed switch while its upward movement is restrained by the support means and also said magnet is capable of being attracted to the magnetic member in the ordinary state, a pusher capable of moving up and down, a first upper spring applied to the pusher member at its one end, and mounted on the magnet at its other

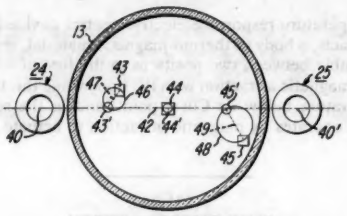
end and a second upper spring also mounted on the magnet and vertically distant from the pusher at a first pushed down displacement of the pusher whereby, before a state in which the pushed down force applied to the pusher overcomes the critical resistance of the sum of the initial resilient force of the lower spring and the magnetic attractive force acting between the support means and the magnet, whereby the magnet carried out the downward snap action thus forming a magnetic field which operates the reed switch, firstly the pusher undergoes the first pushed down displacement while being opposed by the resistance from the first upper spring so that the pushing down force on the pusher equals the force of the sum of the resilient force of the first upper spring and the initial resilient force, and then, the pusher is further pushed to a critical displacement where the pushed down force overcomes the above-mentioned critical resistance force.

3,701,065

COLOR PICTURE TUBE BEAM CONVERGENCE APPARATUS

John Walter Mirsch, Princeton, N.J., assignor to RCA Corporation

Filed Feb. 3, 1971, Ser. No. 112,348
Int. Cl. H01f *1/00*
U.S. Cl. 335—212 **10 Claims**



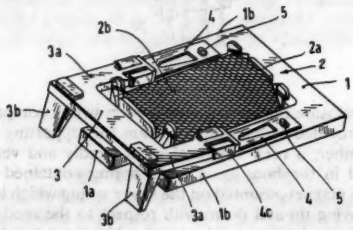
For a color picture tube having a plurality of electron beams emanating from the neck of the tube in a nominally common plane two pairs of diametrically magnetized ceramic ferrite discs mounted on opposite sides of the tube neck are rotatable to vary the strength and orientation of their respectively produced magnetic fields, thereby converging the beams at the screen of the tube.

3,701,066

ELECTROMAGNET ASSEMBLY FOR RELAYS

Werner Bosch, and Ulrich Kobler, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 3, 1971, Ser. No. 139,590
Claims priority, application Germany, May 15, 1970, P 20 23 983.2
Int. Cl. H01f *7/13*
U.S. Cl. 335—274 **14 Claims**



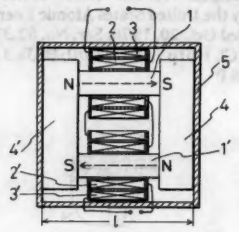
An electromagnet assembly has a U-shaped armature mounted on an electromagnet yoke by means of leaf springs forming extensions of the armature arms and serving to hold the armature normally spaced from the magnetizable yoke, the armature arms and springs being related and connected in an especially advantageous manner.

3,701,067

SATURABLE REACTOR

Shuzo Tsubakihara, Kanagawa, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1972, Ser. No. 221,742
Claims priority, application Japan, Jan. 28, 1971, 46/3795
Int. Cl. H01f *21/00*
U.S. Cl. 336—90 **9 Claims**



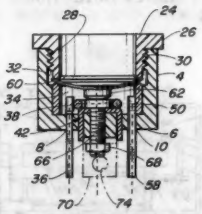
A saturable reactor including a pair of bar type cores which are respectively provided with a primary coil and a secondary coil and are arranged in parallel and a pair of magnets which are provided respectively at both ends of the cores and are arranged to contact the ends of both cores at the same time. The magnets have opposed magnetic poles of different polarity so that a biased magnetic flux flows in the cores. The primary coils are arranged so that primary magnetic fluxes are generated in the same direction with reference to the direction of the biased magnetic flux while the secondary coils are arranged so that secondary magnetic fluxes are generated in the opposite direction to each other in reference to the direction of the biased magnetic flux.

3,701,068

MOTOR PROTECTOR

Eric C. Johnsen, Santa Monica, Calif., assignor to Gem Products, Inc., Santa Monica, Calif.

Filed Nov. 9, 1971, Ser. No. 196,965
Int. Cl. H01h *61/04*
U.S. Cl. 337—102 **12 Claims**

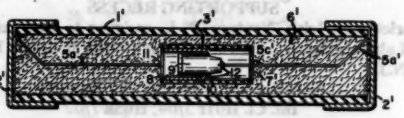


A motor protector especially adapted for action as an electrical switch for the protection of appliance motors from overheating wherein the components of the protector are easily fabricated and are economically and readily assembled for long periods of trouble free use wherein a continuous body contact member is utilized to inhibit or prohibit sparking and the attendant erosive effect of electrical contact members normally encountered in conventional electrical switches.

3,701,069
ELECTRIC CARTRIDGE FUSE

Richard A. Belcher, Hampton Falls, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed May 13, 1971, Ser. No. 142,877
Int. Cl. H01h *8 5/04, 8 5/14, 8 5/18*
U.S. Cl. 337—160 9 Claims

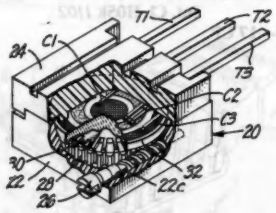


An electric cartridge fuse includes a tubular main casing and a tubular sub-casing inside of the main casing. The latter is closed at least one one side thereby by an additional cover means resting against an axially outer edge of the sub-casing and held in position by a radially outwardly projecting bulge formed in the fusible element of the fuse and engaging the cover means adjacent the center thereof. Further disclosed are other applications of the fusible element bulge concept for positioning partitions in electric cartridge fuses.

3,701,070
WORMGEAR ACTUATED POTENTIOMETER

Kenneth B. Baldwin, Corona, and Ronald D. Sullivan, Riverside, both of Calif., assignors to Bourns, Inc.

Filed Oct. 18, 1971, Ser. No. 190,012
Int. Cl. H01c *1/16*
U.S. Cl. 338—162 5 Claims



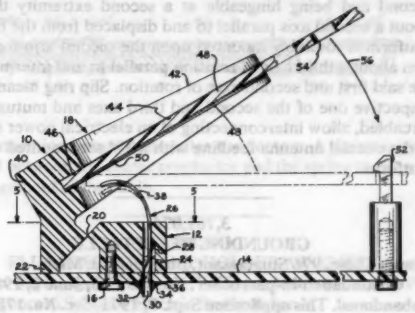
An exceptionally efficient inexpensive miniature wormscrew potentiometer in which three dual-purpose conductors are embedded intermediate their ends in one of two housing members, and positioned to brush respectively upon arcuate or circular conductors and an arcuate resistance element that are carried upon a rotor interlocked with a drive plate which is driven by a wormwheel whose teeth are engaged with a wormscrew that is seated, with the rotor, in a second housing member.

3,701,071
HINGE TYPE CIRCUIT BOARD CONNECTOR BLOCK

Dirk Landman, Mechanicsburg, Pa., assignor to Berg Electronics, Inc., New Cumberland, Pa.

Filed Jan. 18, 1971, Ser. No. 107,267
Int. Cl. H01r *13/54*
U.S. Cl. 339—4 10 Claims

A connector block in which a daughter type circuit board is secured to a mother board by a hinge connection and then rotated about the hinge connection so that contact pads on the daughter board are brought into engagement with contacts on the mother board to form electrical connections therewith.

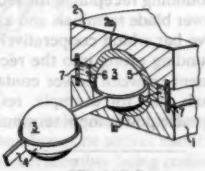


Locking means are provided to hold the daughter board in the contact position relative to the mother board.

3,701,072
MERCURY LOADED BRASS BALL BEARING

James M. Bjorn, 69 18th Avenue, and Frederick Marx, Jr., 1510 North D Street, both of Lake Worth, Fla.

Filed Feb. 22, 1971, Ser. No. 117,465
Int. Cl. H01r *39/46*
U.S. Cl. 339—5 L 2 Claims

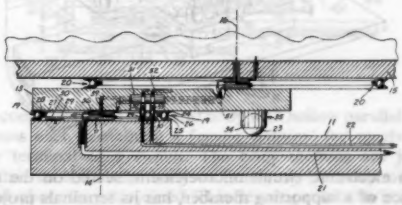


The ball bearing has inner and outer ball races of brass and a series of balls made of brass running in annular grooves in the mating faces of the races. The entire space within the recesses around the balls contain mercury. Bearing seals are disposed between the races adjacent their outer sides. The spaces between the seals and the sides of the mercury are filled with oil. The races are adapted to be connected in an electric circuit to permit the transmission of low voltage signals without frictional audio interference during rotation of the races.

3,701,073
ARTICULATED TV PLATFORM

Walter G. Lale, Downey, Calif.

Filed Aug. 24, 1971, Ser. No. 174,371
Int. Cl. H01r *39/10*
U.S. Cl. 339—5 P 7 Claims



Articulated platform means for allowing adjustable uniplanar orientation of electrical apparatus mounted

thereon, while avoiding cable wrap-up and the like. A first and second arm are mutually hinged at a first extremity thereof for rotation about a first axis, the first arm being longer than the second and being hingeable at a second extremity thereof about a second axis parallel to and displaced from the first. A platform is rotatably mounted upon the second arm for rotation about a third axis of rotation parallel to and intermediate the said first and second axes of rotation. Slip ring means, at a respective one of the second and third axes and mutually intercabled, allow interconnecting of an electrical power source and a coaxial antenna feedline with a TV set mounted on the platform.

3,701,074

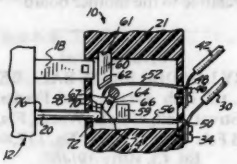
GROUNDING RECEPTACLE

Claude Oster, 976 Stuguessant, Birmingham, Mich.

Continuation-in-part of Ser. No. 829,566, June 2, 1969, abandoned. This application Sept. 7, 1971, Ser. No. 178,025

Int. Cl. H01r *3/06*

U.S. Cl. 339—14 R **9 Claims**



An electrical grounding receptacle for receiving an electrical plug having power blade terminals and a grounding prong, carries an insulative bar which cooperatively pivots upon insertion of the grounding prong into the receptacle, to cause electrical engagement between power contacts receiving the plug blade terminals and, for example, resilient conductors connected to receptacle power input terminals.

3,701,075

ELECTRONIC MICROELEMENT ASSEMBLY

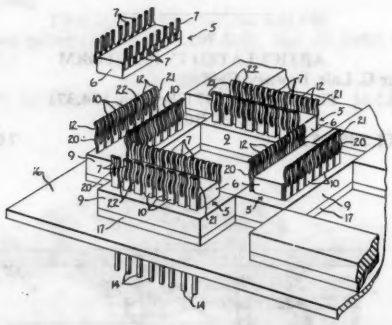
Sten Gunde Schullstrom; Ingvar Freijd; Arne Schader, and Nils Gunnar Olofsson, all of Linkoping, Sweden, assignors to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Sept. 22, 1970, Ser. No. 74,327

Claims priority, application Sweden, Sept. 25, 1969, 13161/69

Int. Cl. H05k *1/02*

U.S. Cl. 339—17 CF **4 Claims**



An electronic circuit microelement, seated on the upper surface of a supporting member, has its terminals projecting upwardly away from said surface to a level well above its body. Elongated connectors, one for each terminal, have medial parts anchored in the supporting member, pin-like lower parts projecting beneath the lower surface of the supporting member, and upper parts formed as upstanding S-shaped spring arms that engage the microelement terminals in a plane spaced above the microelement body so that the connectors can be soldered to the terminals by immersion.

3,701,076

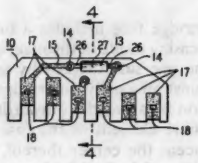
INTERCEPT CONNECTOR HAVING TWO DIODE MOUNTING HOLES SEPARATED BY A DIODE SUPPORTING RECESS

Carleton D. Irish, Neptune, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 18, 1969, Ser. No. 886,259

Int. Cl. H01r *5/04*; H05k *1/02*

U.S. Cl. 339—17 C **4 Claims**



An intercept connector for providing alternative bridging connections between terminals is disclosed in which circuit paths and contact clips are combined on a circuit board in predetermined circuit configurations.

3,701,077

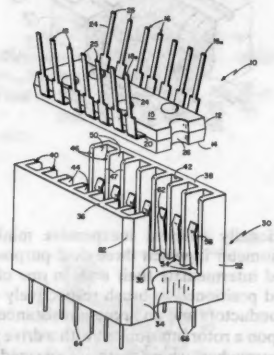
ELECTRONIC COMPONENTS

Cornelius J. Kelly, Jr., Holliston, Mass., assignor to K-Tech, Inc., Framingham, Mass.

Filed Dec. 29, 1969, Ser. No. 888,326

Int. Cl. H05k *1/02*

U.S. Cl. 339—17 CF **6 Claims**

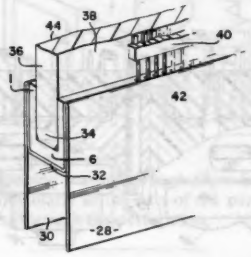


A socket for electronic components particularly useful for "dual-in-line" packages, comprising a housing of electrical insulating material having an end wall defining a closed end, an opposite open end, and a plurality of elec trical contact members extending generally between these ends, each having a spring portion providing a contact surface, each contact surface engaging the outer surface of one of the leads of the electronic component at a point along the length of the lead, when the component is inserted into the socket through its open end in such a way that the circuitry of the component is adjacent the closed end of the socket, and its leads extend therefrom toward the open end of the socket.

3,701,078
BUSSING CONNECTOR

James Edward Lynch, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 4, 1971, Ser. No. 112,602
Int. Cl. H01r *31/08*
U.S. Cl. 339—19 7 Claims

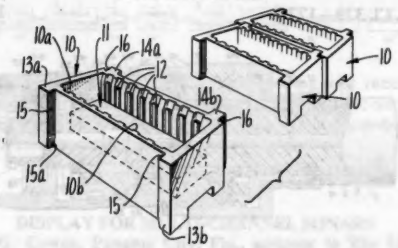


A holder simultaneously operating as a bussing connector for discrete electrical circuits paths on opposed sides of a substrate. The holder is mounted on a circuit board and is provided with discrete electrical paths receiving the discrete electricaL paths of the circuit board. An elongated clamp retains the circuit paths of the holder in electrical contact with the electrical paths of the circuit board. The clamp additionally retains the holder in clamped position on the circuit board.

3,701,079
INTERCONNECTING CARRIER BODIES FOR SEMICONDUCTOR DEVICES

James E. Bowden, 356 Silvertip Court, Milpitas, Calif., and William L. Glick, 1731 Franck Avenue, Santa Clara, Calif.

Filed July 10, 1970, Ser. No. 53,904
Int. Cl. H01r *13/60*; B65d *21/02*
U.S. Cl. 339—36 5 Claims



Carrier bodies for semiconductor devices, each carrier having first and second pairs of spaced surfaces, the first pair of surfaces being spaced apart and complementary to the second pair of surfaces so that the first pair of surfaces of one carrier body may be engaged with the second pair of surfaces on a second carrier body, whereby a plurality of carrier bodies may be assembled to form a stack.

3,701,080
MINIATURE COAXIAL CABLE CONNECTOR

George J. Baisz, Downers Grove, Ill., and Francis R. Shonka, deceased, late of North Riverside, Ill. (by Louise M. Shonka, administratrix), assignors to The United States of America as represented by the United States Atomic Energy Commission

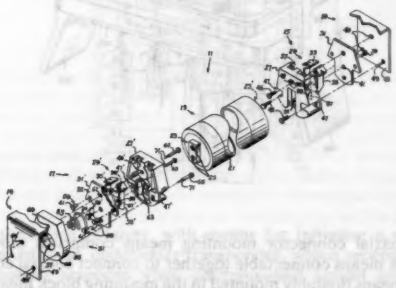
Filed June 2, 1971, Ser. No. 149,309
Int. Cl. H01r *17/04*, *9/12*
U.S. Cl. 339—48 3 Claims

A connector for coaxial cables is formed by using a spring to pull the center conductors of a coaxial cable together to maintain electrical contact therebetween. The spring also connects the outer conductors of the coaxial cable to provide an electrical connection between the outer conductors. A sleeve is positioned between the center conductor and the spring to provide for alignment of the cable.

3,701,081
FLUORESCENT LAMP HOLDER ASSEMBLY

Max L. Jayne, and Charles A. Williams, both of Warren, Pa., assignors to Sylvania Electric Products Inc.

Filed June 18, 1970, Ser. No. 47,203
Int. Cl. H01r *33/08*
U.S. Cl. 339—53 10 Claims

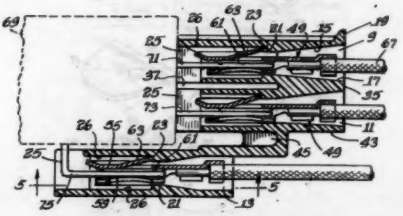


A fluorescent lamp holder assembly having two oppositely opposed socket members, one socket member being rigidly affixed, the other socket member being resilient. Both members are designed so that insertion of a fluorescent lamp is possible without twisting or bending the lamp. Removal of the lamp is also made substantially less difficult.

3,701,082
ELECTRICAL CONNECTOR

Bruno Baumanis, River Forest, Ill., assignor to Molex Incorporated, Downers Grove, Ill.

Filed March 25, 1971, Ser. No. 128,041
Int. Cl. H01r *13/48*
U.S. Cl. 339—61 M 6 Claims



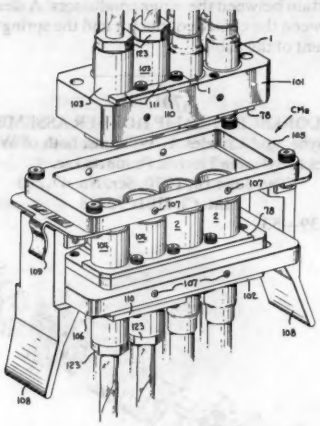
A connector has a dielectric body with hollow parallel body sections each containing a female terminal for receiving a male terminal of a switch. The body sections are joined together such that the body sections may be independently flexed where they are joined. This flexure permits variation in the spacing of the front end openings in the connector, thereby to accommodate in the connector switch terminals of varying spacing.

3,701,083

COAXIAL CONNECTOR MOUNTING MEANS

George William Ziegler, Jr., Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 732,447, May 27, 1968, Pat. No. 3,566,334. This application Sept. 18, 1970, Ser. No. 73,652
Int. Cl. H01r *13/62*
U.S. Cl. 339—64 M 7 Claims



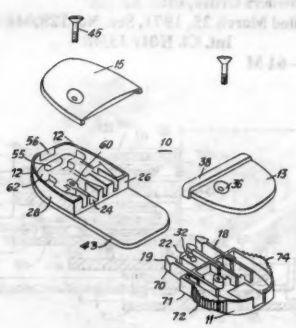
Coaxial connector mounting means comprises mounting block means connectable together to connect coaxial connector means floatably mounted in the mounting block means.

3,701,084

MULTIPOLAR CONNECTOR FOR TELEPHONE SETS

Lorenzo Martinez Gomez, Malaga, Spain, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 6, 1971, Ser. No. 104,408
Int. Cl. H01r *13/62*
U.S. Cl. 339—66 M 2 Claims



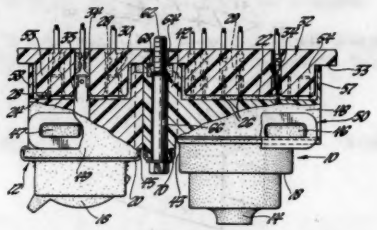
A flat multiple contact connector including a plug and mating socket. The plug contactor springs are paired and the contactor springs of a pair are mounted on opposite sides of an insulating tongue. The tongues are aligned asymmetrically for mating with like openings in the socket bearing individual receiver springs for each contactor spring.

3,701,085

ELECTRICAL CONNECTOR ASSEMBLY

Willard E. Graddy, and Willis H. Anderson, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 18, 1971, Ser. No. 116,537
Int. Cl. H01r *13/54*
U.S. Cl. 339—92 M 2 Claims



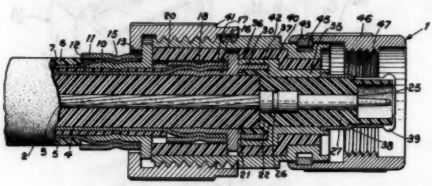
An electrical connector assembly is disclosed wherein a pair of joined connector members are clamped to a third electrical connector member. The paired connector members have a first joint therebetween which prevents relative movement between the members in all but two directions and a second joint between the members and a joint member which prevents relative movement between the paired connector members in the other two directions. The joined pair of connector members are clamped to the third connector member by a fastener which cooperates with the joint member of the second joint.

3,701,086

COAXIAL CONNECTOR

Sherman J. Somerset, Marblehead, Mass., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 28, 1971, Ser. No. 148,046
Int. Cl. H01r *21/20*
U.S. Cl. 339—177 R 1 Claim



This invention is for an electrical connector for a coaxial cable, such as a triaxial cable, which has two concentric outer conductors and an inner conductor, the connector comprising means to clamp separately each of the outer conductors by crimping means to securely fasten each outer conductor to its clamping means.

3,701,087

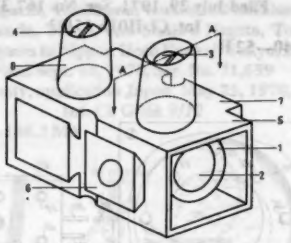
ELECTRIC CONNECTOR DEVICE

Henri Gabriel Bernard, 9, Avenue de Belfort, Saint Claude, France

Filed Feb. 11, 1971, Ser. No. 114,421
Claims priority, application France, Oct. 29, 1970, 7039105
Int. Cl. H01r *9/00*
U.S. Cl. 339—198 G 3 Claims

The invention relates to an electric connector device enabling several connector devices to be connected mechanically as well as electrically; it comprises a metal nucleus perforated axially, at least one means of gripping the electric wire to be connected and a box made of insulating material enclos-

ing the metal core, while leaving access to the extremities of the perforation free; the box and the core comprise in addition



a transversal opening passing through them from end to end located perpendicularly to the axis of the perforation of the core and passing through this perforation.

3,701,088

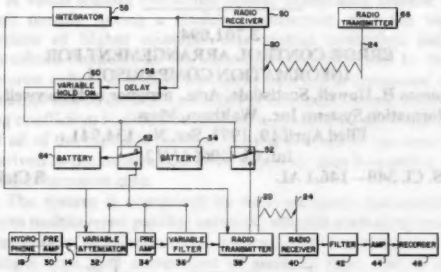
DEMAND SONOBUOY

Richard J. Haase, and William L. Roever, both of Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Filed June 18, 1970, Ser. No. 47,468

Int. Cl. G01s 9/66

U.S. Cl. 340—2 **2 Claims**



A demand sonobuoy having both sending and receiving radio equipment therein. The transmission of seismic data detected by a hydrophone connected to the demand sonobuoy is controlled by radio signal from a remote point.

3,701,089

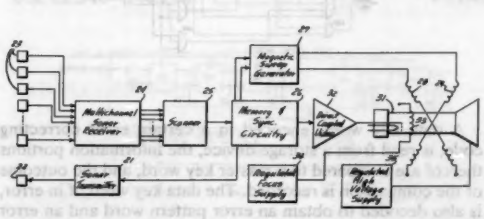
DISPLAY FOR MULTI-CHANNEL SONARS

John G. Cowan, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 20, 1970, Ser. No. 82,247

Int. Cl. G01s 9/66

U.S. Cl. 340—3 R **10 Claims**



This invention discloses an improved visual display arrangement incorporated in and uniquely combined with a multichannel sonar system. The arrangement is characterized as having a low persistance cathode ray tube with low direct current potential on the grid thereof. Improved sweep drive using electromagnetic deflection and an improved magnetic focusing arrangement contribute to the operation thereof. A direct coupled video amplifier and a regulated high voltage power supply complete the novel display arrangement.

3,701,090

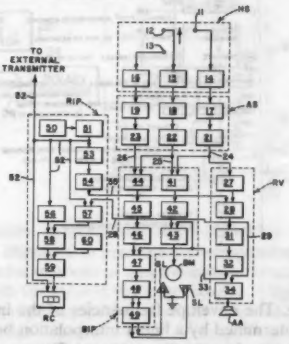
SHIPBOARD ACOUSTIC RECEIVER

Donald B. Heckman, Alexandria, Va., assignor to AMF Incorporated

Filed Dec. 22, 1970, Ser. No. 100,650

Int. Cl. G01s 9/68

U.S. Cl. 340—3 R **6 Claims**



A shipboard receiver, with means for initiating a coded command to an underwater transponder, which receives the transponder response while discriminating against ambient noise and computes and displays the slant range and bearing of a submerged package with the transponder from the receiver.

3,701,091

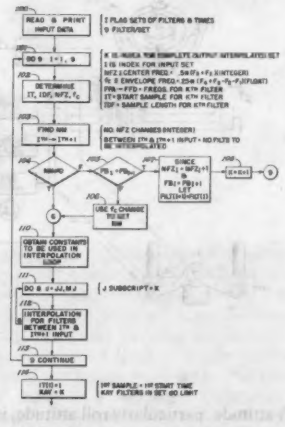
PROCESS OF FORMING TIME-VARIANT FILTERS FOR FILTERING SEISMIC DATA

Jeremiah P. Lenihan, Carrollton, Tex., assignor to Mobil Oil Corporation

Filed Feb. 19, 1971, Ser. No. 116,788

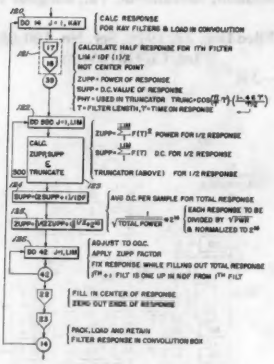
Int. Cl. G01r 1/28

U.S. Cl. 340—15.5 AF **9 Claims**


READ & PRINT INPUT DATA
DO 9 I=1, 9
DETERMINE IT, IDF, NFZ, fc
FIND NO
SINCE
USE fc CHANGE TO SET
OBTAIN CONSTANTS TO BE USED IN INTERPOLATION LOOP
DO 8 J=JJ,M,J
INTERPOLATION FOR FILTERS BETWEEN ITH & ITH+1 INPUT
9 CONTINUE

The specification discloses a process of forming a set of time-variant filters from an input set of filters having predeter-

mined start times. The center frequency and envelope frequency of the input filters are determined and filters are interpolated between adjacent input filters, based upon the difference in center frequency between the adjacent input filters. In the embodiment disclosed, the number of filters interpolated between adjacent input filters is equal to the number of integer frequency changes between adjacent input filters



minus one. The envelope frequencies of the interpolated filters are determined by a linear interpolation between the envelope frequencies of adjacent input filters and the interpolated filters are placed at equally spaced time intervals between adjacent input filters. The length of the input filters and interpolated filters are determined as inversely proportional to their envelope frequencies. The time responses of the filters are determined and truncated with a special truncator.

3,701,092

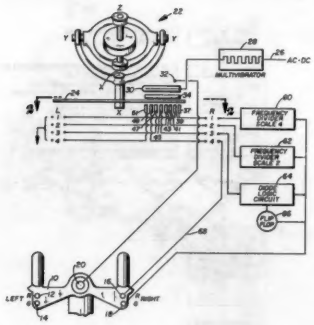
VEHICULAR ATTITUDE-CONTROL DISPLAY

Albert Howard Hasbrook, Blanchard, Okla., assignor to Stanley W. Wilcox, Tulsa, Okla., a part interest

Continuation-in-part of Ser. No. 654,571, July 19, 1967, abandoned. This application Nov. 9, 1970, Ser. No. 88,070

Int. Cl. G08g *5/00*

U.S. Cl. 340—27 AT **14 Claims**



Aircraft attitude, particularly roll attitude, is displayed principally by a visual light system. The lights are positioned within the pilot's peripheral vision space so as to give inattentive control stimulus.

3,701,093

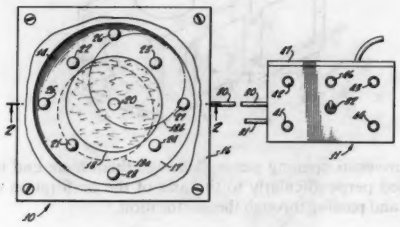
TILT INDICATION APPARATUS

Steve J. Pick, 18192 San Carlos, Fountain Valley, Calif.

Filed July 29, 1971, Ser. No. 167,318

Int. Cl. H01h *35/02*

U.S. Cl. 340—52 H **8 Claims**



Direction and one of several discrete magnitudes of tilt are indicated by a mercury switching arrangement having secondary and tertiary contacts differently spaced from a central primary contact. The secondary contacts are employed to energize low tilt indicators and to give direction of tilt. The tertiary contacts indicate high tilt.

3,701,094

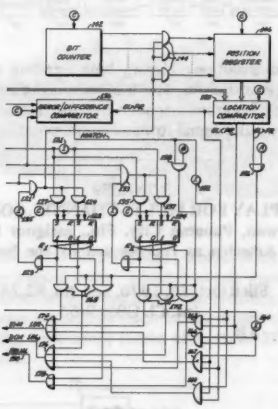
ERROR CONTROL ARRANGEMENT FOR INFORMATION COMPARISON

Thomas H. Howell, Scottsdale, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed April 19, 1971, Ser. No. 134,941

Int. Cl. G06f *11/12*

U.S. Cl. 340—146.1 AL **8 Claims**

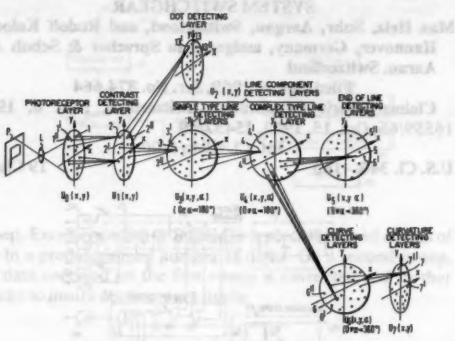


A data key word, encoded in a certain error correcting code, is read from a storage device, the information portions thereof are compared to a master key word, and the outcome of the comparison is recorded. The data key word, if in error, is also decoded to obtain an error pattern word and an error location indication. From the above information, it is determined whether the data key word is greater than, equal to, or less than the master key word. Error protection is provided for the data key word without the necessity of buffering or actually correcting the data key word.

3,701,095
VISUAL FEATURE EXTRACTION SYSTEM FOR CHARACTERS AND PATTERNS

Yukiya Yamaguchi, Yokohama; Kunihiko Fukushima, Tokyo; Minoru Yasuda, Tokyo, and Shojiro Nagata, Tokyo, all of Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed Sept. 14, 1970, Ser. No. 71,659
Claims priority, application Japan, May 25, 1970, 44/44014
Int. Cl. G06k *9/12*
U.S. Cl. 340—146.3 MA **4 Claims**



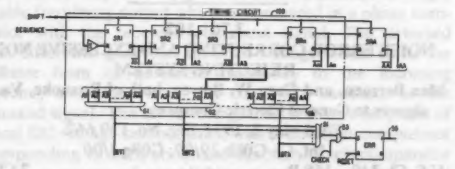
A visual feature extraction system comprising electric circuit models having a similar construction with the visual system of higher animals. The system comprises analog threshold elements as the corresponding elements to visual neuron cells. An analog threshold element is composed in a manner that to each of a plurality of its inputs an interconnecting coefficient is allocated respectively and if an algebraic sum of all of the inputs is positive, a weighted sum of the inputs is derived as the output, and if the algebraic sum is negative, the output becomes zero.

The system is composed by such elements connected to form multilayered parallel network, wherein each layer recognizes one of features such as, contrast, dot, line component of simple type, line component of complex type, end of line, curved portion and curvature, and the layers are interconnected with a predetermined interconnecting characteristics between each other so as to detect the linear portion, the curved portion, etc. of an input pattern.

3,701,096
DETECTION OF ERRORS IN SHIFT REGISTER SEQUENCES

Paul Douglas Hunter, Middletown Twsp., and Richard Erving Machol, Jr., Freehold, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Sept. 1, 1971, Ser. No. 177,047
Int. Cl. H03k *5/18*; **G06m** *3/12*
U.S. Cl. 340—146.1 D **9 Claims**

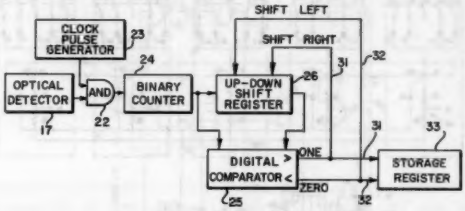


Errors occurring in shift register sequences, such as due to noise bursts or internal shift register faults, are detected by adding a single additional stage to the decoding shift register and connecting it to the usual decoding logic gates in the same pattern as the other shift register stages. Errors are thus caused to appear as a predetermined output from the decoding logic, which output is detected readily by a flip-flop connected thereto.

3,701,097
DECODING BAR PATTERNS

Gerald Wolff, Framingham, Mass., assignor to Identicon Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 44,910, June 10, 1970. This application Jan. 20, 1971, Ser. No. 107,996
Int. Cl. G06k *9/00*
U.S. Cl. 340—146.3 Z **13 Claims**

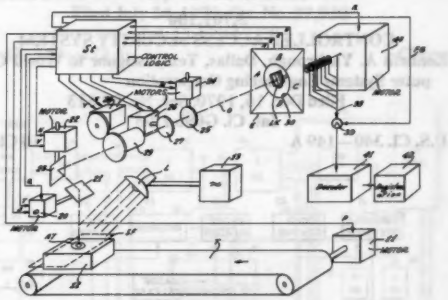


A photoelectric detector and width-coded bar or interval are relatively displaced to produce a corresponding sequence of pulses or pulse intervals of timed duration corresponding to the pattern with variation in the scan velocity. A logical circuit arrangement recalibrates during a scan interval so that the width patterns are accurately detected, despite the variation in scan velocity resulting from relatively displacing the photoelectric detector and pattern to be detected manually.

3,701,098
DEVICE FOR MACHINE READING OF INFORMATION WITHOUT MANIPULATION OF THE INFORMATION CARRIER

Norbert K. Acker, Koenigstein, Germany, assignor to Scanner, Inc., Houston, Tex.

Continuation of Ser. No. 788,302, Dec. 31, 1968, abandoned. This application June 15, 1971, Ser. No. 153,392
Int. Cl. G06k *9/04*
U.S. Cl. 340—146.3 H **17 Claims**



A system is disclosed for reading digitally expressable information from randomly positioned and randomly oriented data fields by detecting presence of a data field in a search field through imaging the search field onto a recognition device and changing position, distortion and magnification of the image until projected onto a read head. Through relative rotation between read head and image or an image therefrom correct orientation for readout is obtained. Particular boundary markings of the data field facilitate position control, particular control markings are used for orientation control. The position control for the data field image is obtained electron optically or through adjustable optical elements.

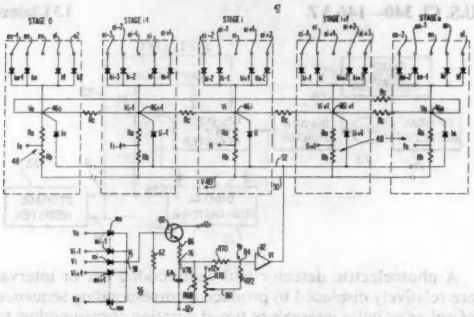
3,701,099
DYNAMIC DISCRIMINATION REFERENCE LEVEL GENERATOR FOR A PARALLEL CHANNEL OPTICAL DOCUMENT SCANNER

Richard E. Hall, and Lawrence P. Segar, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 846,834, Aug. 1, 1969, abandoned. This application June 8, 1971, Ser. No. 150,935

Int. Cl. G06k *9/00, 7/14*

U.S. Cl. 340—146.3 AG **9 Claims**



A discrimination reference level generator which provides a dynamically adjustable reference level for discriminating between the white background of a document and black characters imprinted on the document. The maximum contrast signal from document areas on either side of the document area being scanned are used to control the black-white discrimination level of the scanned area. Furthermore, correlation between the discrimination reference levels of adjacent document areas prevents a sudden decrease in the discrimination reference level between two adjacent document areas. The discrimination reference level is not permitted to fall below a predetermined minimum level which is constant for normal contrast but which is automatically raised when there is an extremely high contrast between the document and the characters imprinted thereon.

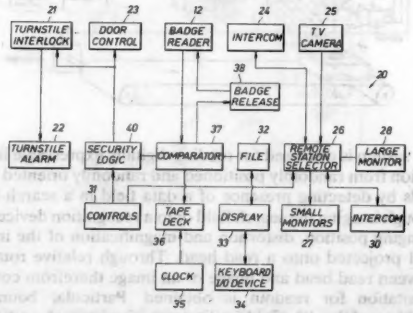
3,701,100
CONTROLLED ACCESS SECURITY SYSTEM

Kenneth A. Yarbrough, Dallas, Tex., assignor to World Computer Systems Engineering Corporation

Filed Dec. 16, 1970, Ser. No. 98,613

Int. Cl. G08b *1/08*

U.S. Cl. 340—149 A **10 Claims**



For use in a building to limit access to a secured area, an apparatus which includes a badge reader installed at the point of entrance, numbered badges for those desiring entrance into the secured area, a remote badge number file storage, an electronic scanner which scans the file when supplied with the number from the badge, and means for remotely electrically opening a door or other entrance to the secured area upon ascertaining authority for the badge holder to enter that particular secured area as evidenced by data from the storage file.

3,701,101
MODULAR REMOTE CONTROL AND SUPERVISORY SYSTEM SWITCHGEAR

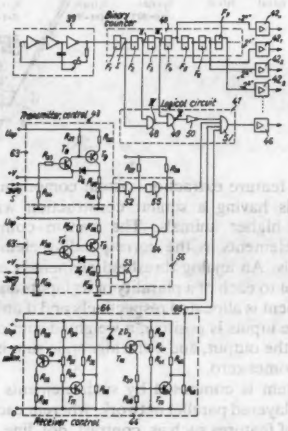
Max Heiz, Suhr, Aargau, Switzerland, and Rudolf Kalocay, Hannover, Germany, assignors to Sprecher & Schuh AG, Aarau, Switzerland

Filed Nov. 6, 1969, Ser. No. 874,664

Claims priority, application Switzerland, Nov. 6, 1968, 16559/68; Oct. 15, 1969, 15452/69

Int. Cl. H04q *9/00*

U.S. Cl. 340—163 **19 Claims**



A switchgear or switchboard comprises a plurality of switching units including command devices, switching devices and signalling devices which are combined according to given switching functions, each of the command devices and switching devices comprises transmitters for delivering command signals and each of the switching devices and signalling devices comprises receivers for receiving the command signals. The command, switching and signalling devices are contained in slide-in units inserted into shelves of a switchbox. Each switch-in unit comprises the transmitters and receivers for the devices contained in the respective switch-in unit, and the transmitters and receivers of all slide-in units are connected to a control cable interconnecting the slide-in units. The control cable is connected to a central unit producing address signals in cyclic sequence and comprising a signal generator for producing read-out signals of a time period which is shorter than that of the address signals.

3,701,102
NOISE ERROR CORRECTING AND EXCESSIVE NOISE REJECTING SYSTEM

Max Berman, and Gary W. Bowen, both of Roanoke, Va., assignors to General Electric Company

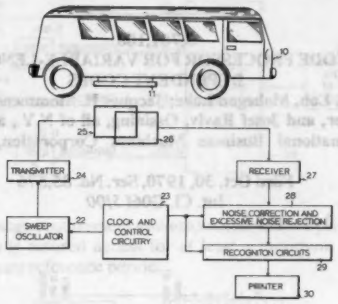
Filed May 3, 1971, Ser. No. 139,662

Int. Cl. G08b *29/00*; **G08g** *1/00*

U.S. Cl. 340—168 R **7 Claims**

A noise error correcting and excessive noise error rejection system for use preferably in an identification interrogation system in which a scanned or swept frequency spectrum is transmitted and certain discrete frequencies are reradiated depending upon the frequency of tuned circuits located on the

object to be identified. The system uses a constant number of bits out of a larger number of bit positions for all symbols or digits used. A check for excessive noise is made by counting the number of bits per digit or symbol received on a first

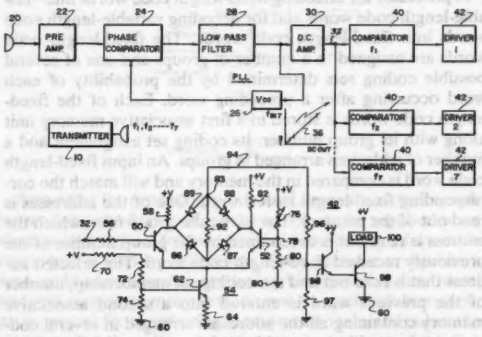


sweep. Excessive noise is defined as a predetermined excess of bits in a predetermined number of digits. On a second sweep, the data received on the first sweep is corrected and further checks to insure accuracy are made.

3,701,103
REMOTE CONTROL RECEIVER USING A PHASE LOCKED LOOP

William J. Padgett, Berwyn, and Donald A. Wison, Chicago, both of Ill., assignors to Warwick Electronics Inc.

Filed April 7, 1971, Ser. No. 132,129
Int. Cl. H04q 9/02
U.S. Cl. 340—170 **7 Claims**

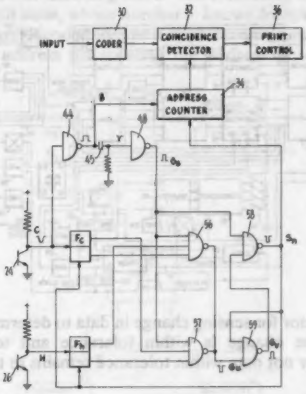


A remote control receiver selectively responsive to a plurality of different frequency command signals to control corresponding different command functions. The receiver uses a phase locked loop including a controlled oscillator having a variable frequency output which is compared in a phase comparator with the received command signal. The detected phase difference generates an error voltage which shifts the oscillator from its quiescent frequency to the incoming frequency and phase locks the controlled oscillator to the command signal. The error voltage also activates only one of several DC voltage comparators, with a different comparator corresponding to each command function. Each comparator includes a means of establishing a reference voltage and means for activating a driver stage for the corresponding remote function when the error voltage generated by the phase comparator to lock the receiver to a particular command frequency and equals the corresponding reference voltage.

3,701,104
ADDRESS SYNCHRONIZER

Neil L. Wiseman, San Ramon, Calif., assignor to The Singer Company

Filed Sept. 6, 1968, Ser. No. 757,870
Int. Cl. G06f 7/02; G06k 15/06
U.S. Cl. 340—172.5 **9 Claims**

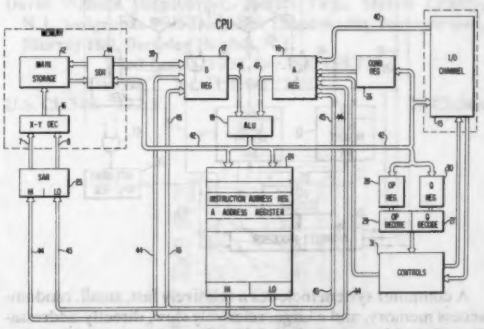


A synchronizer for the address counter of an on-the-fly print wheel has two flip-flops complemented by paired photoelectric signals. One flip-flop responds to all character pads, or spaces, of the wheel and the other to all but one. When the two flip-flops fall out of step, a synchronizing signal is gated for setting the address counter and for also resynchronizing the two flip-flops, which then stay synchronized until the next unpaired signal.

3,701,105
CENTRAL PROCESSING UNIT IN WHICH ALL DATA FLOW PASSES THROUGH A SINGLE ARITHMETIC AND LOGIC UNIT

Edward D. Finnegan; Leonard Roy Harper, both of San Jose, Calif.; Nicholas S. Mitrofanoff, Rochester, Minn., and Allen C. Slutman, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 24, 1970, Ser. No. 57,920
Int. Cl. G06f 7/00
U.S. Cl. 340—172.5 **6 Claims**

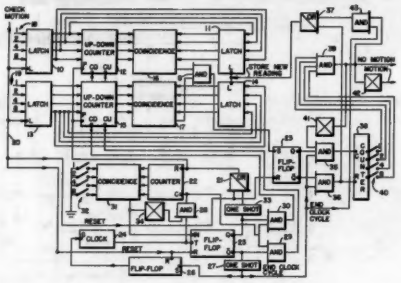


A central processing unit which includes an arithmetic and logic unit, local store registers and general registers, allows for the use of the arithmetic and logic unit for housekeeping purposes such as address modification during portions of a machine cycle. The processing unit contains no counters or compare circuits other than the single arithmetic and logic unit with all data flow being through the arithmetic and logic unit.

3,701,106
DATA CHANGE DETECTOR

Richard C. Loshbough, Toledo, Ohio, assignor to Reliance Electric Company, Toledo, Ohio

Filed Dec. 7, 1970, Ser. No. 95,614
Int. Cl. G06f *3/04*
U.S. Cl. 340—172.5 **11 Claims**

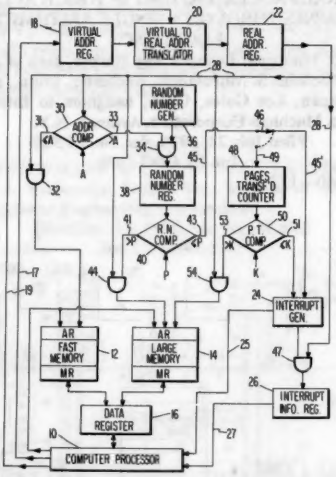


A detector for sensing change in data to determine whether or not the change is within tolerance and to determine whether or not data within tolerance remains in tolerance for a period.

3,701,107
COMPUTER WITH PROBABILITY MEANS TO TRANSFER PAGES FROM LARGE MEMORY TO FAST MEMORY

John Garland Williams, Princeton, N.J., assignor to RCA Corporation

Filed Oct. 1, 1970, Ser. No. 77,141
Int. Cl. G06f *7/00*
U.S. Cl. 340—172.5 **9 Claims**

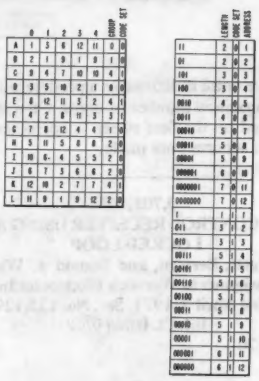


A computer system includes a relatively fast, small, random-access memory, and a large, relatively slow, directly-addressable, random-access memory. An address comparator is receptive to the contents of a real address register and has a first output indicating that the desired word is stored in the fast memory, so that the contents of the real address register can be used to address the fast memory. The address comparator has a second output indicating that the desired word is in the large memory. In this second case, the contents of the real address register is used to directly address the large memory a majority of the time, under control of a random probability device. The remaining small proportion of the time, the computer is interrupted and caused to transfer a page of memory words, including the desired word, from the large memory to the fast memory.

3,701,108
CODE PROCESSOR FOR VARIABLE-LENGTH DEPENDENT CODES

Louis S. Loh, Mohegan Lake; Jacques H. Mommens, Briarcliff Manor, and Josef Raviv, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1970, Ser. No. 85,576
Int. Cl. G06f *5/00*
U.S. Cl. 340—172.5 **16 Claims**



A processor for encoding fixed-length code words into variable-length code words and for decoding variable-length code words into fixed-length code words. The fixed-length code words are assigned to a number of groups and one of several possible coding sets determined by the probability of each word occurring after a preceding word. Each of the fixed-length code words is stored in a first associative memory unit along with its group number, its coding set assignment and a number of addresses arranged in groups. An input fixed-length code word is compared in the memory and will match the corresponding fixed-length stored word. One of the addresses is read out of the memory. The particular group from which the address is read out is determined by the group number of the previously received fixed-length code word. The selected address that is read out and the coding set membership, number of the previous word is entered into a second associative memory containing all the addresses arranged in several coding sets along with the variable-length code words. A match in the second memory unit on an address and a coding set number produces a variable-length code word for the input fixed-length code word. The first memory unit also provides the group number and coding set number for the next input fixed-length code word to be encoded. Decoding is performed in a similar but reverse manner starting with the variable-length coded data being entered into the second memory.

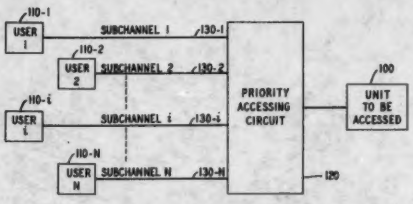
3,701,109
PRIORITY ACCESS SYSTEM

Theodore Richmond Peters, Bernardsville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 9, 1970, Ser. No. 87,980
Int. Cl. G06f *9/18*
U.S. Cl. 340—172.5 **14 Claims**

Methods and apparatus are described which provide for granting access to a computer or other system to a plurality of

users having different priorities. Each user is assigned to a priority group within which all users receive sequential access. Priority groups as a whole are granted access in accordance

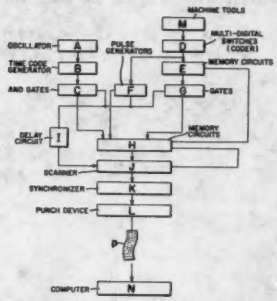


with their usage requirement and associated relative priorities. Each group is assured access for at least a minimum period within a longer reference period.

3,701,110
APPARATUS FOR PRODUCING A PUNCHED TAPE RECORD FOR RECORDING WORKING CONDITIONS OF MACHINE TOOLS

Taisuke Tsugami, No. 415, 1-chome, Shimo-Ochiai, Shinjuku-ku, Tokyo, Japan

Filed Nov. 18, 1970, Ser. No. 90,668
Claims priority, application Japan, Nov. 22, 1969, 44/93371
Int. Cl. G01d 9/00; G06k 1/00
U.S. Cl. 340—172.5 **1 Claim**



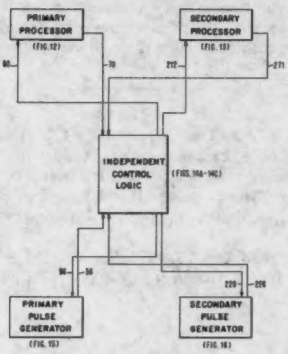
Apparatus for producing a punched tape record for recording working conditions of machine tools, to be supplied to an electronic computer for automatically computing information representing working efficiency. The apparatus comprises a time code generator for producing binary coded time data, first and second memory devices, one for each machine took, gating means for transferring in response to selected pulses the binary coded time data and the memory contents of the first memory devices into the second memory devices, and means for sequentially scanning the memory contents of the second memory devices and activating a punch device to punch the memory contents of the second memory devices into a tape.

3,701,111
METHOD OF AND APPARATUS FOR DECODING VARIABLE-LENGTH CODES HAVING LENGTH-INDICATING PREFIXES

John Cocke, Mt. Kisco; Jacques H. Mommens, Briarcliff Manor, and Josef Raviv, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 8, 1971, Ser. No. 113,473
Int. Cl. G06f 7/00
U.S. Cl. 340—172.5 **20 Claims**

This code conversion method enables data which has been coded in the form of variable-length bit strings for data compaction purposes to be processed by hardware units of conventional design that handle data in the form of fixed-length bit strings. The coding scheme is such that in the bit string of each variable-length code whose length exceeds a certain fixed number of bits N, the first N bits constitute a "length prefix" which uniquely designates the code length. This N-bit prefix is decoded by a first decoding table to give a base address in a second decoding table. The remaining bits of the variable-length code, whose number is known from the length prefix, then are decoded to give a displacement value relative to the base address for locating the address at which the



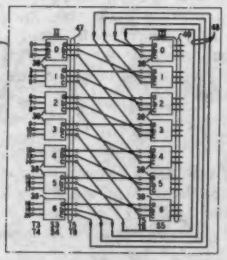
BLOCK DIAGRAM OF INDEPENDENT DECODER

decoded fixed-length word is found. Concurrently with the execution of this second decoding step, the first step in the decoding of the next variable-length code is performed. If a variable-length code does not have more than N bits, it is decoded in one step by the first decoding table, which stores the decoded word at every address therein which may be designated by all possible N-bit combinations containing the aforesaid variable-length code as their leading portion. A length indication read out of the first table then shifts the address register contents by an appropriate amount to bring the next succeeding variable-length code into the leading position therein.

3,701,112
BALANCED, INCOMPLETE, BLOCK DESIGNS FOR CIRCUIT LINKS INTERCONNECTING SWITCHING NETWORK STAGES

David William Hagelbarger, Morris Twp., Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 4, 1971, Ser. No. 150,138
Int. Cl. H04l 11/00
U.S. Cl. 340—172.5 **26 Claims**



A first stage of a switching network includes a plurality *v* of switching matrices each including a predetermined number *r* of input signal terminals and output signal terminals. At least

one different pair of links for signal path connection is provided for outputs of each pair of first stage matrices to some one of b k-input switching matrices of a second stage of the network. Links from any first stage matrix extend to only a portion of the output stage matrices and are arranged in accordance with a balanced, incomplete block design derived from combinatorial theory to distribute the link connections substantially evenly among the second stage matrices. The 2-stage network is itself a block design switching matrix that is useful for building higher order networks. A block design matrix also is combined, through time slot interchanging circuits or another switching stage, with a network of mirror image configuration so that signal path pairs established in the second network are the mirror image of path pairs established for the same communication through the first network.

3,701,113

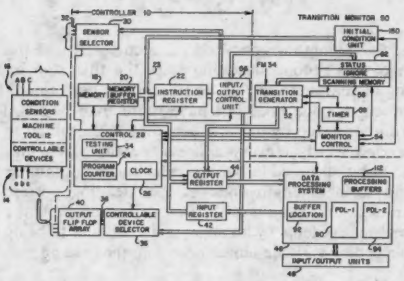
ANALYZER FOR SEQUENCER CONTROLLER

Donald E. Chace, Concord; James A. Melvin, Jr., Norwood, both of Mass.; Alan W. Ricketts, Jr., Derry, N.H.; Edward P. Steinberger, Marlboro, and David T. Symmes, Danvers, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 13, 1971, Ser. No. 171,542

Int. Cl. G06f *15/46;* **G05b** *11/32, 1/01*

U.S. Cl. 340—172.5 **16 Claims**



A monitor for a programmed sequence of operations. A sequence controller responds to successive instructions. Some instructions correspond to elements of governing functions and test the status of independent variables to activate controllable devices, which correspond to dependent variables, when functions are satisfied. The monitor, operating in synchronism with the controller, generates a transition word each time the controller either (1) tests a sensor for an independent variable in the function or (2) prepares to alter a controllable device, if a comparison with the last condition of that sensor or device in a memory unit indicates a change has occurred or will occur. The monitor also updates this memory unit to the new condition. Each transition word identifies the changing element and describes the change. A data processing system stores each transition word in sequence for comparison with a reference list of transition sequences.

3,701,114

CAPACITIVE SYMMETRIZATION OF A STORAGE

Josephus Theodorus Maria Kuijper, Beekbergen, Netherlands, assignor to U.S. Philip Corporation, New York, N.Y.

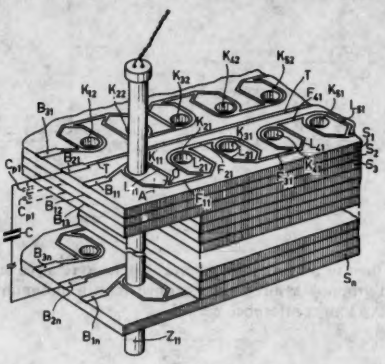
Filed April 3, 1970, Ser. No. 25,351

Claims priority, application Netherlands, April 4, 1969, 6905736

Int. Cl. G11c *17/00*

U.S. Cl. 340—173 SP **1 Claim**

The invention relates to a "read-only" storage formed by a pile of plates having printed circuits. The parasitic capacitances between the wirings of these plates differ with the lower and upper plates from those with the other plates.



By providing an additional capacitance between the input terminals of the circuits of the lower and upper plates this assymmetry is obviated.

3,701,115

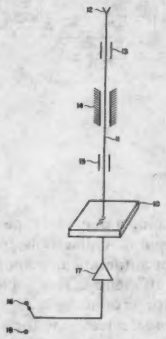
RECORDING INFORMATION ON A LAYER OF ORTHOFERRITE WITH AN ELECTRON BEAM

Sidney Ivor Joseph Ingrey, Ottawa, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Feb. 22, 1971, Ser. No. 117,312

Int. Cl. G11c *11/14, 13/00;* **G01d** *15/34*

U.S. Cl. 340—173 CR **7 Claims**



Recording information on a layer of orthoferrite by exposing the layer to an electron beam. The electron beam alters the electrical conductivity of the layer wherever it impinges. Information can be retrieved by scanning with an electron beam to detect the variations in conductivity.

3,701,116

MEMORY STORE WITH REDUNDANCY

Hermanes Johannus Maria de Haan, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 799,466, Feb. 14, 1969, abandoned. This application July 27, 1971, Ser. No. 166,614

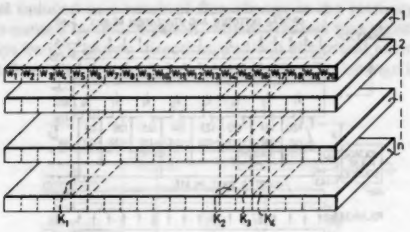
Claims priority, application Netherlands, Feb. 19, 1968, 6802365

Int. Cl. G11c *13/00*

U.S. Cl. 340—173 R **3 Claims**

A word-organized memory store wherein information is stored in the form of digitized words along parallel lines in a

matrix arranged in stacked relationship with other parallel matrices containing similarly arranged redundant words. The



matrices containing redundant words are displaceable in a direction transverse to the direction in which the words are stored.

3,701,117

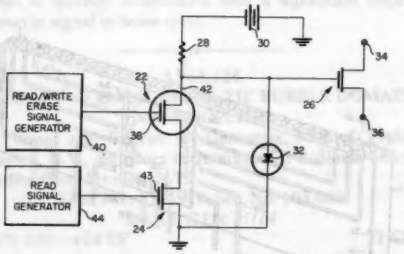
PHOTO-SELECT MEMORY SWITCH

Melvin L. Fuller, Los Angeles, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jan. 29, 1970, Ser. No. 6,744

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 R **5 Claims**



The disclosed microcircuit and integrated circuit arrays are adapted to be functionally configured in response to radiant energy applied thereto during a configuring period. Elements and circuits of the arrays are selectively interconnected by photo select switching devices which operate as either an open or closed switch depending on whether the particular photo select switching device was illuminated by a light beam, for example, during the configuring (setting) period. Each photo select switching device comprises a solid state memory device operatively coupled to a photo diode such that the non-volatilely stored conductive characteristics of the memory device are determined by the conductive state of the photo diode during the setting period. The memory device in turn controls a solid-state switching transistor which is coupled in a connecting path of the array, thereby providing a desired switching function determined by the pattern of the illuminating energy during the setting period.

3,701,118

OPTICAL STORAGE MEDIUM & METHOD OF MAKING & USING

James E. O'Connor, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Continuation-in-part of Ser. No. 72,235, Sept. 14, 1970. This application July 23, 1971, Ser. No. 165,710

Int. Cl. G11c *13/04*

U.S. Cl. 340—173 LS **14 Claims**

This disclosure is directed to a reversible, yet optionally permanent dual electro-optical record and storage medium, bistable in both the optical and electrical modes and non-volatile in the electrical mode having high resistivity contrast in the electrical mode between the write and erase states, high resolution and contrast in the optical mode between the write and erase states, high resolution and contrast in the optical mode between the write and erase states. The record medium can be used for display purposes and is capable of high bitpacking density and thermal micro-recording and erasure and comprises a fired ceramic glaze containing an intimate mixture of reducible lead oxide and reducible copper oxide as a major component and silica and alumina as minor components and wherein the mole ratio of lead (as lead oxide) to copper (as copper oxide) can range from about 0.1 to about 12.0:1. Magnesia can be included in said glaze as a minor component.

3,701,119

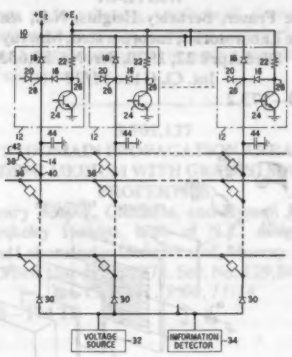
CONTROL CIRCUITRY AND VOLTAGE SOURCE FOR USE WITH CHARGE STORAGE DIODE

Sigurd Gunther Waaben, Princeton, and Walter Ira Weiss, Montclair, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1971, Ser. No. 214,131

Int. Cl. G11c *5/02, 11/36*

U.S. Cl. 340—173 R **7 Claims**



A control circuit consists of essentially a first charge storage diode and means for creating a reservoir of minority carriers within the first diode which, when desired can be utilized to almost instantaneously cause minority carriers to be created in a second charge storage diode. The second diode is useful as a switch which, for a preselected period of time, becomes a short circuit that allows current flow in the reverse direction through the diode, but then automatically becomes an open circuit. A voltage source, especially adapted for use with the control circuit is also described.

3,701,120

ANALOG CAPACITOR MEMORY WITH SLOW WRITE-IN AND FAST NONDESTRUCTIVE READ-OUT

Robert L. Charters, Bellevue; James M. Bartlemay, Seattle; John M. Folline, Kent, and Thomas G. Donich, Federal Way, all of Wash., assignors to The Boeing Company, Seattle, Wash.

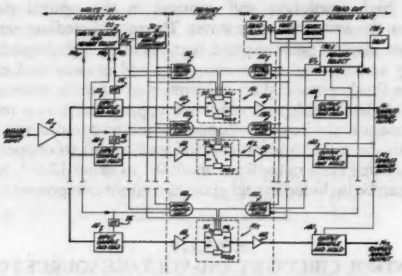
Filed Sept. 18, 1969, Ser. No. 862,633

Int. Cl. G11c *7/00, 11/24, 27/00*

U.S. Cl. 340—173 R **16 Claims**

An analog memory capable of write-in at a relatively low rate and independent, nondestructive read-out at a relatively high rate. A single write-in and read-out address logic is pro-

vided for as memory units are desired. Each memory unit includes a matrix of sample and hold microcircuits, each having



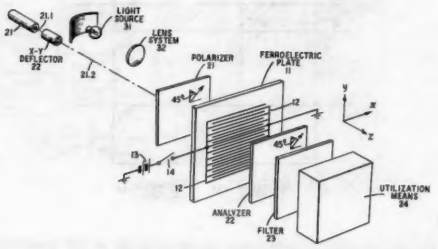
an external storage capacitor, an isolation amplifier and independent input and output analog switching in response to vertical and horizontal write-in and read-out addressing.

3,701,121

FINE GRAIN FERROELECTRIC CERAMIC OPTICAL DISPLAY DEVICE UTILIZING THERMAL DEPOLING WRITE-IN

David Bruce Fraser, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed April 22, 1970, Ser. No. 30,633
Int. Cl. G11c *11/22*
U.S. Cl. 340—173.2 **10 Claims**



An optical display device includes a fine grain polycrystalline ferroelectric ceramic plate, which is located between an optical polarizer and an analyzer. The ferroelectric plate is "reset" by means of an applied electric field, which electrically polarizes the entire plate. Then, the plate is subjected to a "write-in" by means of an intensity modulated scanning electron (or laser) beam, which locally heats and thereby selectively depolarizes portions of the plate. The plate is then subjected to a "readout" beam of light, which is selectively transmitted through the device at those portions of the plate which have been exposed to maximum intensity of the "write-in" beam.

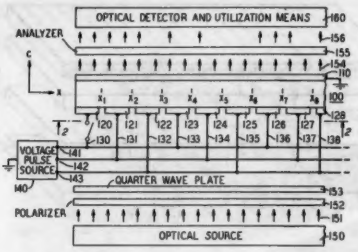
3,701,122

FERROELECTRIC DOMAIN SHIFTING DEVICES

Joseph Edward Geusic, Berkeley Heights; Terence John Nelson, New Providence, and David Paul Schinke, Berkeley Heights, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 25, 1971, Ser. No. 174,727
Int. Cl. G11c *11/22*
U.S. Cl. 340—173.2 **10 Claims**

Ferroelectric crystals which are also ferroelastic, such as gadolinium molybdate, can support stable internal ferroelectric polarization domains. These domains are expanded and moved in the ferroelectric crystal by means of a sequence of voltages applied to electrodes on the surface of the crystal. Thereby, optically readable, shift register logic functions are



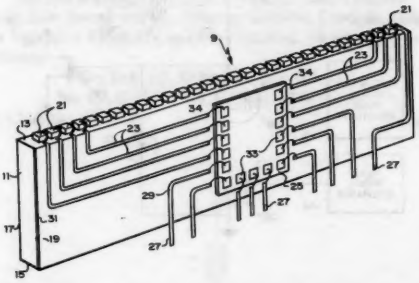
achieved using (for readout) an incident optical beam with respect to which the ferroelectric domains are birefringent.

3,701,123

HYBRID INTEGRATED CIRCUIT MODULE

John C. Barrett, Sunnyvale; Howard C. Borden, Atherton, and Egon E. Loebner, Palo Alto, all of Calif., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Oct. 29, 1969, Ser. No. 872,031
Int. Cl. G11c *11/42*; H01l *1/22*; H05b *33/14*
U.S. Cl. 340—173 LS **8 Claims**



A visual display module includes a thin thermally conductive substrate. The substrate has a narrow top edge surface on which a linear array of closely spaced electroluminescent display elements are mounted, a bottom edge surface along which there are disposed terminals for receiving input power and binary coded signals for controlling the display elements, and a lateral surface on which an integrated circuit chip and a signal conductors are located. The integrated circuit chip contains a decoding network for selectively addressing the display elements in response to the binary coded signals, write-erase gating means for conditioning an addressed display element into an "on" or "off" state, and memory circuits for holding each display element in its "selected" state. The display elements are disposed in a viewing plane perpendicular to the lateral surface of the substrate, so that a plurality of modules can be stacked adjacent to one another to produce an expandable high density display field.

3,701,124

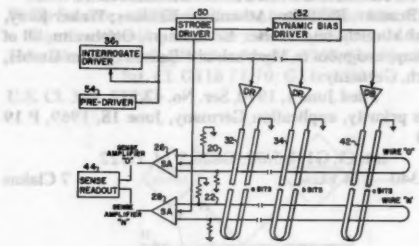
APPARATUS TO EFFECT IMPROVED READOUT OF MEMORY ELEMENTS

Anthony M. Apicella, Jr., Massillon, and Jon M. Surprise, Akron, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed July 1, 1970, Ser. No. 51,469
Int. Cl. G11c 7/02, *11/04, 11/14*
U.S. Cl. 340—174 RC **2 Claims**

The invention provides an improved signal to noise ratio for readout of memory elements. Essentially, the idea comprises

apparatus associated with a memory element to act coincident with the normal interrogation of the memory element to provide a dynamic electrical bias coincident with the electrical signal induced as a result of flux change in the memory element caused by interrogation, which dynamic bias signal will always be in a known direction, and will either add to or subtract from the electrical signal representing flux change in the



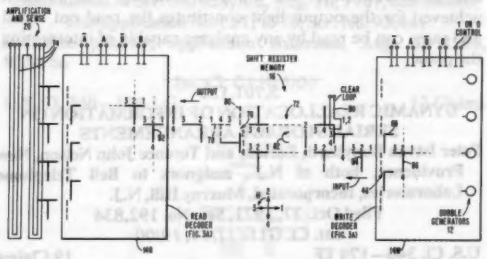
memory element during interrogation so as to either enhance or substantially eliminate the electrical readout signal from the memory element. With the application of proper logic in the sense determination of the electrical readout signal from the memory element, the information stored in the memory element is thereby determined with a significant improved resultant in signal to noise ratio.

3,701,125

SELF-CONTAINED MAGNETIC BUBBLE DOMAIN MEMORY CHIP

Hsu Chang, and Eugene R. Genovese, both of Yorktown Heights, N.Y., assignors to Internaional Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,046
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 TF **21 Claims**



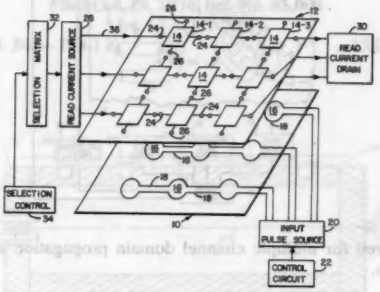
A complete on-chip memory system for cylindrical bubble domains and a magnetic chip decoder for the system. Write and read decoding, memory storage, and sensing are provided on a single magnetic chip with a minimum number of interconnections and ease of fabrication. Decoding is achieved using magnetic overlays for propagation and current loops to provide selective switching at various locations. N control lines enable selective connections between 2^N domain generators and 2^N shift registers. The decoders have 2^N double propagation channels, each of which has two parallel paths. One path connects a generator to a shift register while the other path terminates in a bubble buster. Each shift register comprises a storage loop having bubble splitters, thus enabling NDRO. The storage loops are connected to a double propagation channel in a read decoder. Sensing means are connected to the output of the read decoder.

3,701,126

STATIC NON-DESTRUCTIVE SINGLE WALL DOMAIN MEMORY WITH HALL VOLTAGE READOUT

Robert W. Reichard, Wellesley, Mass., assignor to Honeywell Information Systems, Waltham, Mass.

Filed Jan. 4, 1971, Ser. No. 103,408
Int. Cl. G11c *11/14, 11/18*
U.S. Cl. 340—174 HA **11 Claims**



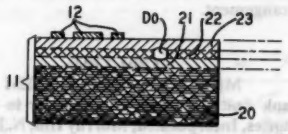
A memory system having single wall domains movable between determinate stable positions and including a Hall probe element matrix arrangement, each element in alignment with one of such positions.

3,701,127

MAGNETIC DOMAIN PROPAGATION ARRANGEMENT INCLUDING MEDIUM WITH GRADED MAGNETIC PROPERTIES

Andrew Henry Bobeck, Chatham, and Hyman Joseph Levinstein, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed March 31, 1971, Ser. No. 129,866
Int. Cl. G11c *19/00, 11/14*
U.S. Cl. 340—174 TF **16 Claims**



The movement of single wall domains in an internal layer of a film of magnetic material permits operation unencumbered by surface defects or interactions with substrates on which the film is formed for bias fields over a range which is large compared to the range of bias fields characteristic of films in which single wall domains extend from surface to surface.

3,701,128

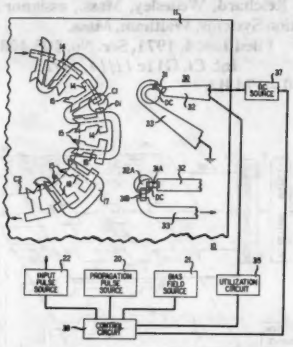
DETECTOR FOR MAGNETIC DOMAIN ARRANGEMENT

John Alexander Copeland, III, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 30, 1971, Ser. No. 158,288
Int. Cl. G11c *19/00, 11/14*
U.S. Cl. 340—174 TF **3 Claims**

A magnetoresistance detector for single wall domains exhibits particularly attractive properties if a captive domain is permanently associated with the element which has its resistance varied in the presence of an information representative domain. The latter domain varies the position of the cap-

tive domain. The arrangement relieves the constraints on positioning and alignment of a plurality of detectors as might be

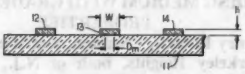


required for multiple channel domain propagation arrangements.

3,701,129
SELF-BIASING SINGLE WALL DOMAIN ARRANGEMENT

John Alexander Copeland, III Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 28, 1971, Ser. No. 193,454
Int. Cl. G11c *11/14, 19/00*
U.S. Cl. 340—174 TF **14 Claims**

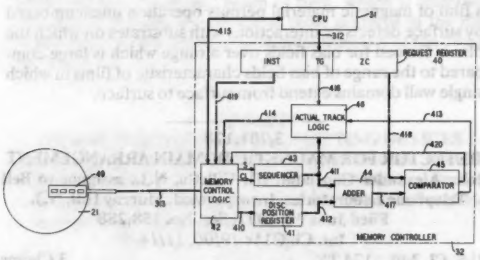


A zero bias, single wall domain propagation arrangement is achieved by forming a layer of magnetic material in which single wall domains can be moved in stripes having dimensions to be self-biasing. A number of different types of domains are found to coexist in such strips leading to a relatively flexible storage arrangement.

3,701,130
MEMORY ACCESS SYSTEM

Cyrus Frank Ault, Wheaton, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 10, 1971, Ser. No. 114,295
Int. Cl. G11b *27/10*
U.S. Cl. 340—174.1 J **13 Claims**

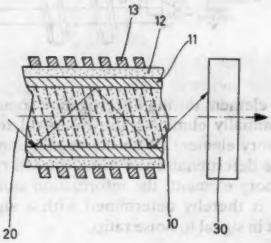


A memory controller, in compliance with a memory access request from a central processor, selectively accesses a revolving memory surface. The memory controller supervises this access by expanding a memory position address specifying the memory access apparatus' relationship to the revolving memory surface, and then comparing the expanded position address with a requested address which designates a memory zone to which access is desired. A straightforward expansion of the memory position address is made possible by beneficially organizing the addresses identifying the memory zones on the memory surface.

3,701,131
MAGNETO-OPTIC STORAGE ELEMENT

Klaus J. Brauser, Baldham; Athanasios Kritikos; Walter Kroy, both of Munich, and Walter E. Mehnert, Ottobrunn, all of Germany, assignors to Messeschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed June 1, 1970, Ser. No. 42,012
Claims priority, application Germany, June 18, 1969, P 19 30 907.0
Int. Cl. G11b *5/00;* **G02b** *5/14, 11/22*
U.S. Cl. 340—174 YC **7 Claims**

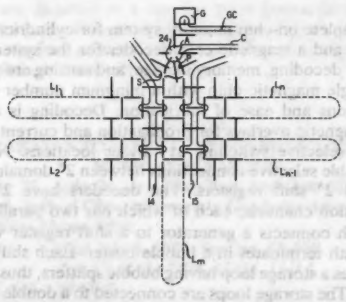


Magneto-optic storage element for the storage of information. A nonconductive carrier, such as glass, is provided with a ferromagnetic metal or metal alloy coating which is in turn coated with an evaporated homogenous dielectric and optically transparent layer. An electromagnetic field is caused to surround the ferromagnetic layer. If plane-polarized light is reflected from the magnetic layer, the plane of polarization thereof is rotated due to the Kerr effect. If plane-polarized light penetrates the magnetic layer, same is then rotated due to the Faraday effect. The magnetization applied to the magnetic layer determines the rotation of e plane of polarization and same constitutes the input information. The rotation achieved for the output light constitutes the read out signal and same can be read by any analyzer capable of interpreting the plane.

3,701,132
DYNAMIC REALLOCATION OF INFORMATION ON SERIAL STORAGE ARRANGEMENTS

Peter Istvan Bonyhard, Edison, and Terence John Nelson, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 27, 1971, Ser. No. 192,834
Int. Cl. G11c *11/14, 19/00*
U.S. Cl. 340—174 TF **19 Claims**



The field access mode of operating a single-wall domain mass memory is adapted for the reordering of stored informa-

tion depending on the recency of use of the information. The memory is organized in the familiar major-minor loop arrangement where information is transferred from minor loops to the major loop for write and read operations. Reordering is permitted by a modification of the elements which define the major loop.

3,701,133

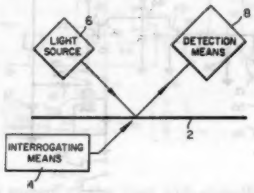
MODULATED MAGNETOOPTIC READOUT SYSTEM

Philip Smaller, and David Treves, both of Palo Alto, Calif.

Continuation-in-part of Ser. No. 593,934, Nov. 14, 1966, abandoned. This application May 5, 1967, Ser. No. 637,872

Int. Cl. G11b *11/10*; G11c *13/04*

U.S. Cl. 340—174.1 **5 Claims**



A noise reduction scheme for magnetooptic readout systems using magnetic media wherein the state of magnetization which represents the stored information is modulated by the application of a modulating field wherein the light reflected from respective binary bits is distinctive thereof, and wherein the modulated component of the distinctive reflected light is detected to determine the state of magnetization and thus the information stored.

3,701,134

HIGH DENSITY AND HIGH FREQUENCY DIGITAL RECORDING USING ELONGATED BITS TO OVERCOME THE EFFECTS OF TAPE DROUPOUTS

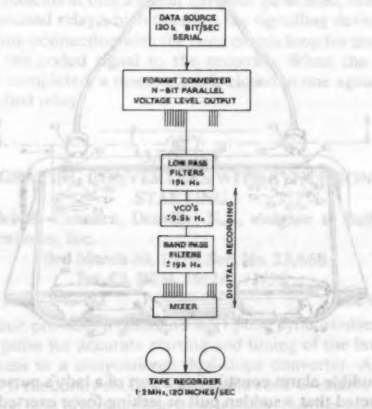
Paul O. Gillard, Salisbury, Australia, assignor to The Commonwealth of Australia Care of the Secretary, Melbourne, Victoria, Australia

Continuation of Ser. No. 659,732, Aug. 10, 1967, abandoned. This application Nov. 27, 1970, Ser. No. 93,441

Claims priority, application Australia, Aug. 1, 1966, 9550/66

Int. Cl. G11b *5/06*

U.S. Cl. 340—174.1 G **12 Claims**



High density and high frequency digital recording in which groups of the serial bits are coded and paralleled and simultaneously recorded on a given magnetic or other track so that each bit is lengthened by a factor up to the number of paralleled bits, and on play back each bit is separated from each other bit by use of a decoding process and if necessary rearranged in serial format.

3,701,135

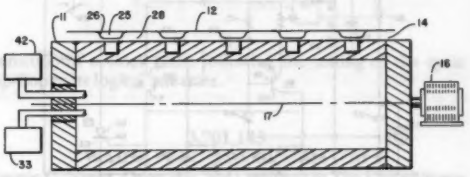
FOIL BEARING CONTROL APPARATUS

Robert H. Price, Minnetonka, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Oct. 29, 1970, Ser. No. 85,008

Int. Cl. G11b *5/60*

U.S. Cl. 340—174.1 E **13 Claims**



A magnetic recording apparatus in which a stationary magnetic recording strip ridges over a rotating drum on a cushion of air. Magnetic heads are located at the surface of the drum, for reading, writing, and erasing information on the magnetic strip. Both vacuum and positive air pressures are used to achieve spacing control between drum and strip. The vacuum pulls the strip down closer to the magnetic heads and the positive air pressure restores the strip to its previous flying height.

3,701,136

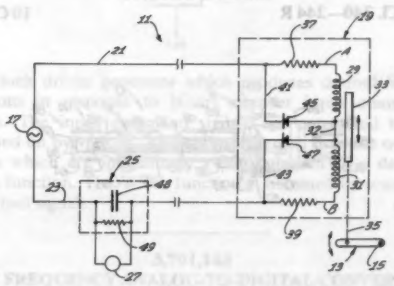
SYSTEM FOR DETECTING THE POSITION OF A MOVABLE ELEMENT

Curtis E. Stevens, Irvine, and Chandler A. Phillips, La Canada, both of Calif., assignors to Bertea Corporation, Irvine, Calif.

Filed July 14, 1969, Ser. No. 841,489

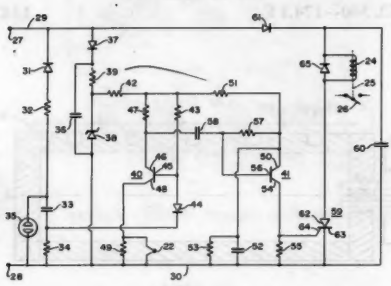
Int. Cl. G08c *19/00*

U.S. Cl. 340—199 **9 Claims**



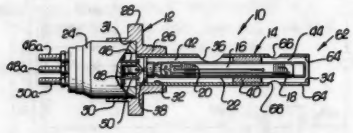
The system includes a position transducer connectible to an ac power supply for providing an electrical signal which is a function of the position of a movable member. The position transducer divides the ac input into at least two components with each component being a function of the position of the movable member. There is an average dc level of the ac signal in accordance with the relationship between the two components of the ac signal. A suitable crossover network separates the dc level from the ac and an indicator provides an indication of the position of the movable element in response to the dc level.

3,701,137
TRANSISTORIZED THERMOCOUPLE FLAME DETECTOR
William H. Hulsman, Needham, Mass., assignor to Control Design, Inc., Needham, Mass.
Filed Sept. 29, 1970, Ser. No. 76,386
Int. Cl. F23m 5/10; G08b 17/06; H01h 47/26
U.S. Cl. 340—228 R 2 Claims



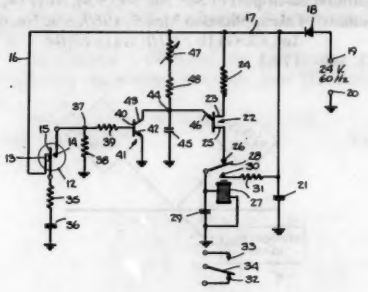
A system for detecting the presence of a burner flame in which the flame heats a thermocouple which is connected to the emitter of a transistor. The transistor is connected to conduct heavily when the thermocouple is cold and to conduct less heavily when the thermocouple is hot. A circuit which generates periodic pulses of voltage is connected to the transistor to cause it to conduct heavily upon the occurrence of each pulse, thus causing a substantial change in the conduction of the transistor only when the thermocouple is hot. This change in conduction generates a control voltage which is used to activate a control relay to control the flow of fuel to the burner.

3,701,138
FLUID LEVEL SENSOR AND SYSTEM
Joseph H. Pulliam, and Thomas W. McCurnin, both of Tucson, Ariz., assignors to Data Engineering, Inc., Tucson, Ariz.
Filed March 25, 1971, Ser. No. 128,038
Int. Cl. G08b 23/00
U.S. Cl. 340—244 R 10 Claims



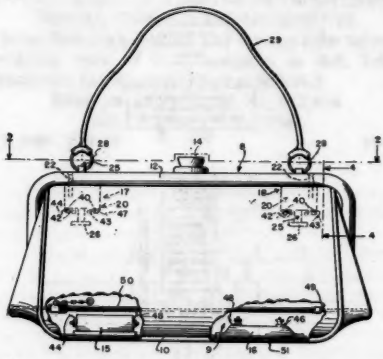
A sensor and system for sensing the level of fluid in a vessel above and below a predetermined level. The sensor comprises a base for mounting on a wall of the vessel with control and reference resistors on a support member extending from the base into the vessel. The resistors form legs of a normally balanced bridge circuit having an indicator connected to its output. A hollow housing having fluid inlet, outlet, and meniscus breaking means surrounds the resistors and support member to insure that the resistors are covered by fluid when fluid in the vessel is at or above the predetermined level and to rapidly drain and expose the control resistor when the fluid drops below the predetermined level to unbalance the bridge circuit and produce an indication at the indicator.

3,701,139
APPARATUS FOR DETECTING INTERRUPTION IN THE CYCLIC MOVEMENT OF A MEMBER
Walter R. Creuz, Chatham, N.J., assignor to Aero-Flow Dynamics, Inc. (The Wing Company Division), Linden, N.J.
Filed Sept. 17, 1970, Ser. No. 73,057
Int. Cl. G08b 21/00
U.S. Cl. 340—271 1 Claim



A single-pole double-throw magnetic reed switch responds to the passage of one or more magnets on the periphery of a rotating air-to-air energy exchange wheel to signal through an interval timing circuit any interruption in wheel rotation even if a magnet stops adjacent the switch. Actuation of the reed switch couples a voltage pulse from a charge storage capacitor to a transistor for resetting the timing circuit to start another timing cycle. If a subsequent actuation of the switch does not occur before the timing circuit completes a timing cycle, the signalling device is energized.

3,701,140
PURSE THEFT ALARM
Richard W. Dixon, 5905 St. Lo Avenue, Rockville, Md.
Filed March 5, 1971, Ser. No. 121,410
Int. Cl. G08b 21/00
U.S. Cl. 340—283 5 Claims

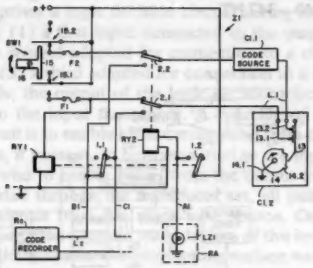


An audible alarm constituting a part of a lady's purse and so consttucted that a sudden pull or jerking force exerted on the purse handle will cause the alarm to be actuated. The alarm unit is so constructed that it will continue to operate until a part of the unit is dismantled to effect a deactivation of the alarm.

3,701,141
WARNING SYSTEM WITH PLURAL IDENTIFICATION OF SIGNALLING STATIONS

Clifton B. Andrews, North Pembroke, Mass., assignor to The Protectowire Co., Hanover, Mass.

Filed April 29, 1971, Ser. No. 138,470
Int. Cl. G08b 25/00
U.S. Cl. 340—287 10 Claims



A signalling system of the type with signalling devices stationed in protected premises and, upon actuation, transmitting a signal to a central receiving location. In the central receiving location, the system situates a plurality of zonal monitoring circuits, each of which is connected to and monitors a plurality of coded signalling devices forming a loop circuit. Each of the zonal monitoring circuits responds to reception of a coded signal by indicating through a first output path that a signal was received and by transmitting through a second output path the coded signal. At the receiving location, the receiver has an annunciator or indicator portion connecting with the first output paths of the zone circuits to indicate, for example by lighting a lamp, from which particular zone a signal originated. Also at the receiving location, a recorder portion is provided which connects in a loop with the second output paths of the zone circuits, and which both receives and records the coded signal, thereby providing a dual basis for positively identifying the location of a particular signalling device which has been actuated.

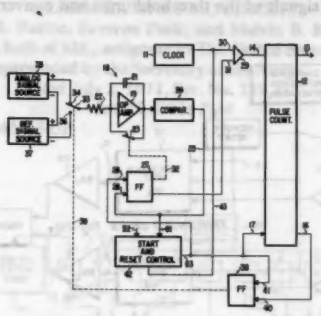
In operation, the coded signalling devices provide a signal by opening their loop circuits. The zone circuits respond to this open circuit condition by de-energizing a relay which was energized through a loop circuit, which simultaneously removes a shunt placed across the zone circuit's second output path, closes a circuit through the first output path to provide an indication that a signal has been generated, and energizes a second relay which transfers the signalling device loop circuit into connection with the zone circuit loop for transmission of the coded signal to the recorder. When the coded signal is completed, a reset switch is closed to one again energize the first relay.

3,701,142
INTEGRATING CONVERTERS WITH SYNCHRONOUS STARTING

Alexander B. Cannara, Denville, N.J., assignor to Ballantine Laboratories, Inc.

Filed March 30, 1970, Ser. No. 23,668
Int. Cl. H03k 19/28, 13/20
U.S. Cl. 340—347 NT 24 Claims

A circuit provides a reset and start pulse synchronized with a clock pulse for accurate starting and timing of the integrating process in a conventional dual-slope converter. A cycle flip-flop is randomly set to a logical one state to enable a gate to pass the next inverted pulse from a clock. Further pulses are inhibited from passing through the gate by an inhibit signal generated by a toggling flip-flop responsively to the trailing edge of the gate output pulse. The leading edge of the gate output pulse is used to reset the counter to zero, to start the integrating process and to open a gate to pass clock pulses to the counter, all substantially coincident with the first negative

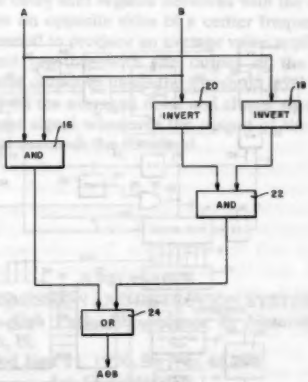


transition of a clock pulse following the setting of the cycle flip-flop to its logical one state.

3,701,143
WALSH FUNCTION GENERATOR

George G. Nacht, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 24, 1970, Ser. No. 66,418
Int. Cl. H04l 3/00
U.S. Cl. 340—347 DD 2 Claims



A clock driven generator which produces desired Walsh functions in response to binary number input command signals. The input command signals are connected to be operated on by various circuitry and thereby produce output signals which are individually a particular bit of a desired Walsh function. The Walsh function is obtained by scanning the output signals.

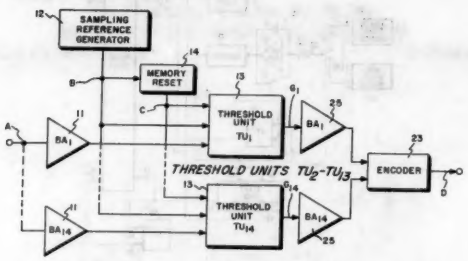
3,701,144
HIGH FREQUENCY ANALOG-TO-DIGITAL CONVERTER

Dennis E. Fineran, Santa Ana, and Samuel J. Fendley, Mountain View, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 28, 1970, Ser. No. 84,684
Int. Cl. H03k 13/02
U.S. Cl. 340—347 AD 4 Claims

An analog-to-digital converter having a signal generator providing a sinusoidal reference signal which is to be compared to a high frequency analog signal, a plurality of threshold units each biased to trigger an output signal at a predetermined discrete level of the difference between the reference signal and the analog signal, a memory reset unit receiving the reference signal and providing a reset signal for

clearing the output signals therefrom at a predetermined time in each cycle of the reference signal, and an encoder receiving the output signals of the threshold units and converting them



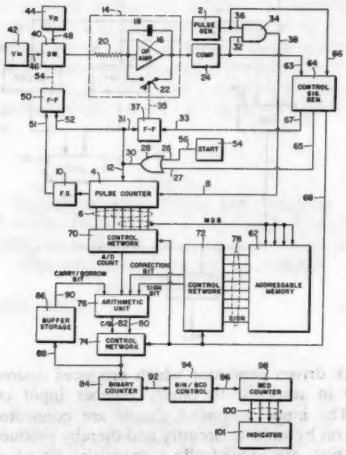
into a digital code. The time of the reset signal is determined to be after either positive or negative peak of the reference signal.

3,701,145

ANALOG TO DIGITAL CONVERTER

William P. Bergin, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 4, 1970, Ser. No. 86,766
Int. Cl. G06f 5/00; H03k 13/02; H04l 3/00
U.S. Cl. 340—347 NT **14 Claims**



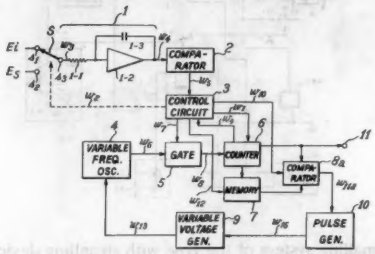
An integrating analog to digital conversion apparatus includes means whereby a non-linear input variable is time integrated for a fixed period of time. A fixed reference source of opposite polarity to said input variable is then time integrated for a variable second period of time. The second variable time period being registered in a digital pulse counter, whereby the digital output of the counter at the termination of the second time period is representative of the value of the input variable. The apparatus includes addressable memory means having stored therein digital correction data, control network means for transferring digital data between elements of the apparatus, arithmetic means for modifying, in singular bit fashion, the digital output of the pulse counter in order to effect digital linearization of the non-linear input variable. Secondary counter means operationally stores within itself the resultant modified singular data bits, whereby the digital output of the secondary counter means is representative of the linearized value of the non-linear input variable.

3,701,146

ANALOG-DIGITAL CONVERTER USING AN INTEGRATOR

Ichiro Haga, and Sieechi Tamada, both of Tokyo, Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha a/k/a Iwatsu Electric Co., Ltd.

Filed Dec. 7, 1970, Ser. No. 95,752
Claims priority, application Japan, Dec. 8, 1969, 44/97813; Dec. 8, 1969, 44/97814
Int. Cl. H03k 13/10, 13/14
U.S. Cl. 340—347 NT **4 Claims**



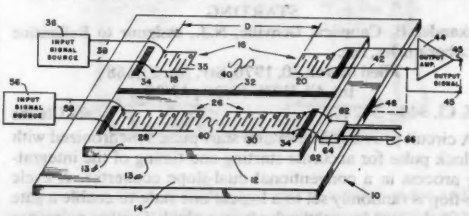
An analog-digital converter using an integrator, in which after an analog signal is integrated by the integrator during a constant time, the input of the integrator is switched to a reference voltage reverse to the polarity of the input analog signal, and the time from the switching time of the input of the integrator to the time when the output of the integrator reaches a predetermined level is measured by counting clock pulses so that the counting result corresponds to the analogue value of the input analog-signal. The clock pulses are generated by a variable frequency oscillator and the repetition frequency of the clock pulses is controlled by a compared result between the counting result of an instant period and the counting result of an immediately adjacent period until the two counting results coincide with each other, so that effect of noise of any repetition frequency superposed on the input voltage is effectively eliminated.

3,701,147

SURFACE WAVE DEVICES FOR SIGNAL PROCESSING

Harper John Whitehouse, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Continuation-in-part of Ser. No. 793,148, Jan. 22, 1969, abandoned. This application Feb. 3, 1971, Ser. No. 112,165
Int. Cl. H03k 13/02
U.S. Cl. 340—347 DA **12 Claims**



A distributed-transducer surface wave device for signal processing of the type which comprises a crystal substrate

upon which is disposed at least one transducer set, including an input transducer adapted for connection to an input electrical signal and an output transducer, each transducer including at least a pair of interdigitated electrodes, the application of an electrical signal to the input transducer causing surface wave propagation on the surface of the crystal substrate, the electrodes of the transducers being aligned in a direction perpendicular to the direction of wave propagation, wherein the interdigitations of the electrodes are generally coded, for example, according to a Barker code. The surface wave device further comprises a logic decision circuit having three input connections: (1) a first input connected to the output transducer; (2) a second adapted for connection to a clock sync source; and (3) a third adapted for connection to a source of binary signals; the output of the logic decision circuit being connected to the input transducer. A function of the logic devision circuit is to enable an incoming pulse from the binary signal source, if present, to be transmitted to the input transducer, otherwise to enable pulses from the output transducer to be circulated through the transducer set, all pulses being clocked by signals from the clock sync source. One of the main functions of the acoustic wave devices of this invention is to serve as a delay line for the propagating surface wave.

3,701,148

ANALOG TO DIGITAL CONVERTER

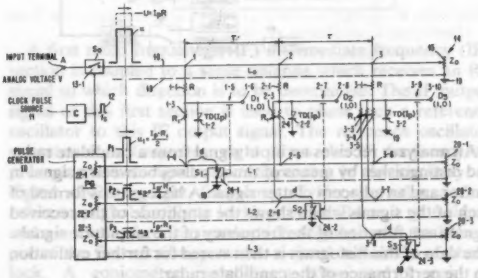
Armin H. Frei, Ruschlikon, Zurich, Switzerland, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 817,760, April 21, 1969, abandoned. This application Nov. 24, 1971, Ser. No. 202,034

Claims priority, application Switzerland, June 20, 1968, 9192/68

Int. Cl. H03k *13/06, 13/17*; **H04l** *3/00*

U.S. Cl. 340—347 AD **7 Claims**



This disclosure provides an analog to digital converter comprising *n* tunnel diode measuring circuits connected at regular intervals to a transmission line. One end of the line is tied to a gate circuit which samples analog voltages under control of a clock signal; the other end of the line is terminated in its characteristic impedance. The measuring circuits are connected in accordance with their ordinal numbers to n measuring transmission lines supplying calibrated measuring pulses derived by a pulse generator from the clock signal. In each measuring line, a short circuiting switch is inserted after the first connection of the line to a respective measuring circuit, each switch being connected for control to the digital output of the corresponding measuring circuit.

3,701,149

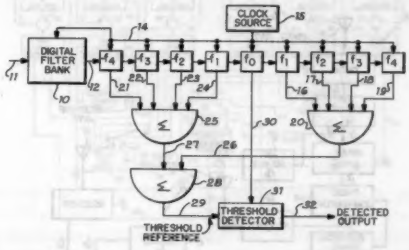
FREQUENCY AVERAGING CONTROLLED FALSE ALARM RATE (CFAR) CIRCUIT

Terence R. Patton, Severna Park, and Melvin B. Ringel, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed July 2, 1971, Ser. No. 159,311

Int. Cl. G01s *7/34*

U.S. Cl. 343—5 DP **4 Claims**



A frequency averaging CFAR circuit having a digital filter bank for receiving radar doppler echoes that are conducted sequentially into serially connected metal oxide semiconductor (MOS) type delay shift register networks with the outputs of shift registers on opposite sides of a center frequency register being summed to produce an average value applied to a threshold circuit together with the output of the center frequency register output to cause the threshold level to vary in accordance with the averaged noise and clutter signals and to detect a target signal whenever the output of the center frequency register exceeds the threshold.

3,701,150

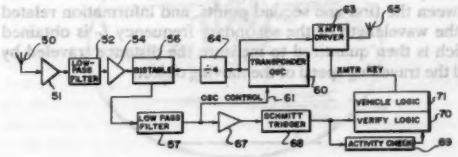
RF TRANSMISSION AND DETECTION SYSTEM

John S. Dame, Oak Park, Ill., assignor to Motorola Inc., Franklin Park, Ill.

Filed June 11, 1970, Ser. No. 45,293

Int. Cl. G01s *9/56*

U.S. Cl. 343—6.5 SS **13 Claims**

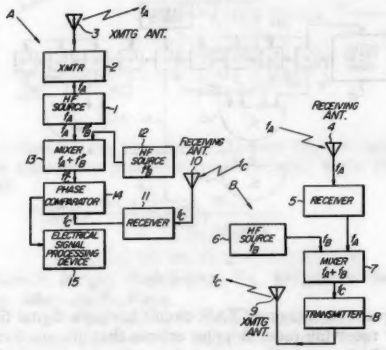


An interrogation station includes a master frequency oscillator controlled to perform as an FSK oscillator for the transmission of data from the interrogation station. In addition this oscillator provides an injection frequency for the mixer of an interrogation station receiver. In a transponder, an oscillator is locked to a multiple of the received interrogation station signal frequency and is used as the transponder transmitter oscillator for controlling the frequency of signals transmitted from the transponder to the interrogation station receiver.

3,701,151
METHOD AND APPARATUS FOR MEASURING THE DISTANCE OF TRAVEL AND THE SPEED OF A MOVING OBJECT

Kazuo Sato, and Takashi Aoki, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyo-shi, Japan

Filed Feb. 23, 1971, Ser. No. 118,036
Int. Cl. G01s 9/24, 9/46
U.S. Cl. 343—9 **3 Claims**



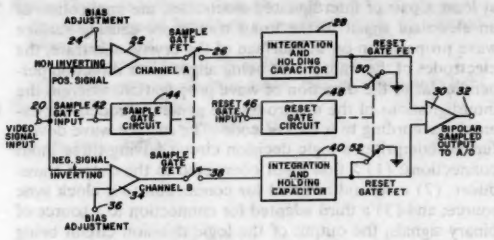
A method and apparatus for measuring the distance traveled by and the speed of a moving object incorporating a frequency mixing system, in which both a transmitter and a receiver are mounted on a moving object to be measured and also at a fixed point so that, when one of the moving objects and the fixed point is assumed as a first point and the other as a second point, a radio wave having a first reference frequency f_A and transmitted from the transmitter at the first point is received at the second point where a secondary frequency f_C is generated with the sum of the first reference frequency f_A received and an internally-generated second reference frequency f_B, and this secondary frequency f_C is then transmitted from the second point and is received at the first point where this received wave of the frequency f_C is mixed with another secondary frequency having the same frequency as that of the secondary frequency f_C, which is generated with the sum of the first reference frequency f_A and another second reference frequency of the same frequency as that of the second reference frequency f_B which is generated at the first point, so as to produce crests or valleys in the resultant waves, whereby in accordance with variations of the distance traveled between the first and second points, and information related to the wavelength of the secondary frequency f_C is obtained which is then quantized to measure the distance traveled by and the travelling speed of the moving object.

3,701,152
BIPOLAR SAMPLE AND HOLD CIRCUIT

Harold K. Howard, Arroy o Grande, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 20, 1970, Ser. No. 56,562
Int. Cl. G01s 9/02, 9/22
U.S. Cl. 343—16 M **7 Claims**

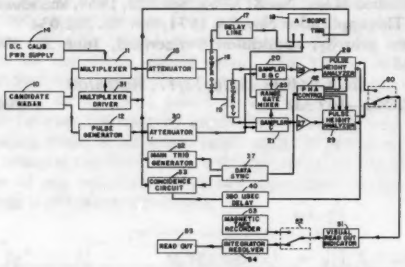
A bipolar sample and hold circuit which samples raw video signal returns from a radar, integrates the energy of the signal during that sample and holds the integrated sample long enough for an analog to digital (A/D) converter to convert the signal energy to a digital number.



3,701,153
RADAR TESTING IN A CLUTTER ENVIRONMENT

Richard P. Gagliardi, China Lake, Calif.; Allen F. Beans, Ivyland; Alfred M. Eddowes, Doylestown, and Herbert Greenblatt, Philadelphia, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 4, 1971, Ser. No. 112,526
Int. Cl. G01s 9/02
U.S. Cl. 343—17.7 **9 Claims**



An analyzer receives an input signal from a candidate radar and distinguishes by means of timed pulses between a signal in clutter and an adjacent clutter signal. A histogram is formed of each of the signals which shows the amplitude of the received signals as a function of the frequency of the amplitude signals. The data of this histogram is then stored for further evaluation on the performance of the candidate radar.

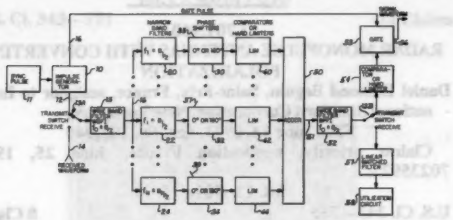
3,701,154
MATCHED FILTER

Edward J. McKinney, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed March 9, 1971, Ser. No. 122,403
Int. Cl. G01s 7/36, 9/23
U.S. Cl. 343—18 E **3 Claims**

A matched filter having a frequency band signal input which is coupled through a wide band filter, through a plurality of narrow band filters coextensive in frequency with the wide band filter to phase code and decode the signal, through a similar number of hard limiters or comparators to an adder,

and through a band pass filter, all between transmit-receive (T-R) switches of an electromagnetic echo ranging target de-

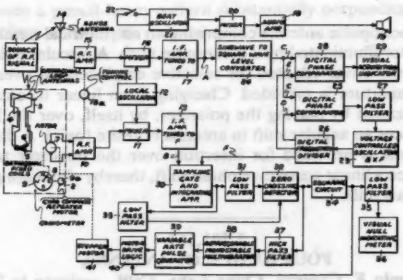


tection system to detect targets in noise interference and countermeasure environments.

3,701,155
AUTOMATIC DIRECTION FINDER

Henry G. Adams, West Orange, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Oct. 26, 1970, Ser. No. 84,037
Int. Cl. G01s 3/42
U.S. Cl. 343—117 R **16 Claims**

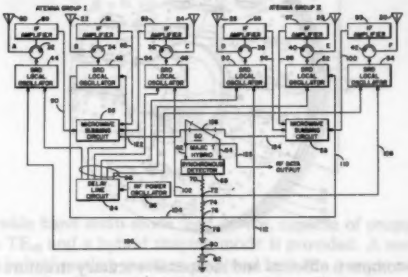


A first radio frequency (RF) intermediate frequency (IF) section is coupled to a sense antenna which receives an RF signal to which direction is to be determined. The IF output signal of this first section is used to phase lock a reference oscillator to this IF output signal. The reference oscillator operates at a frequency eight times the IF frequency to prevent spurious signals from appearing in the circuitry. A digital divide-by-eight frequency divider provides a first reference signal for phase locking the oscillator, a gate signal and a second reference signal which, together with the IF output of the first section, provides a visual indication of phase lock. A goniometer including a rotor and a pair of orthogonally disposed loop antennas also receive the RF signal for application to a second RF/IF section. The IF output signal of the second section is gated by the gate signal into an integrating amplifier. The output signal of the integrating amplifier is detected by a zero crossing detector whose output signal is applied to a squaring circuit and also a monostable multivibrator whose output signal drives a variable frequency (rate) pulse generator. The output signal of squaring circuit and the output signal of the pulse generator are operated on by logic circuitry whose output signal controls a stepper motor. The stepper motor mechanically adjusts the rotor of the goniometer to produce a null in the IF output signal of the second section. The rotor also moves a pointer to indicate relative bearing with respect to the bow. A gyro compass repeater may move a calibrated card or ring to display the true bearing of the signal.

3,701,156
ANTENNA ARRAY BEAM SCANNING SYSTEM

Derling G. Killion, San Diego, Calif., assignor to Ryan Aeronautical Company, San Diego, Calif.

Filed Aug. 18, 1969, Ser. No. 850,973
Int. Cl. H01q 3/26
U.S. Cl. 343—117 A **9 Claims**

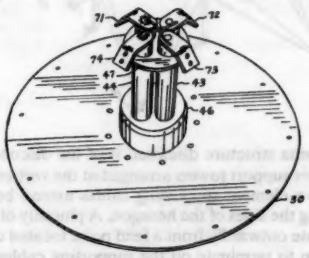


An antenna array beam scanning system in which the antenna system beam pointing positions are scanned by providing a typical discriminator response for targets located at different angles to a given phase front alignment. The discriminator output is used to progressively phase the antenna array through step recovery diode local oscillators by using the discriminator output as a DC bias to linearly phase shift the step recovery diode local oscillators and make the antenna array beam track a target.

3,701,157
HELICOPTER UHF ANTENNA SYSTEM FOR SATELLITE COMMUNICATIONS

Jerome W. Uhrig, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the United States Air Force

Filed June 3, 1971, Ser. No. 149,495
Int. Cl. H01q 1/28
U.S. Cl. 343—708 **2 Claims**



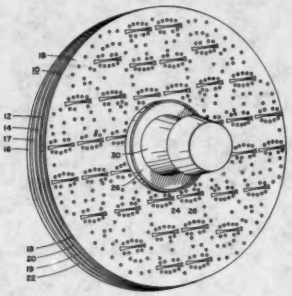
A UHF antenna comprising crossed dipoles in the shape of drooped bow ties, encased by a polyester fiberglass laminated cone, positioned above and rotating with the blades of the helicopter, and orthogonally fed by a coaxial transmission line running through the hollow rotating mast provides an antenna for overhead signal transmission and reception. A coaxial rotary joint is placed inside the mast at the lower end to make a rotating electrical connection with the feed line.

3,701,158

DUAL MODE WAVE ENERGY TRANSDUCER DEVICE

Robert Henry Johnson, Scottsdale, Ark., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 22, 1970, Ser. No. 4,975
Int. Cl. H01q *13/01*
U.S. Cl. 343—725 **9 Claims**



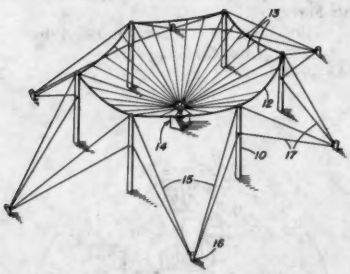
A compact, efficient and inexpensive unitary structure comprising a circular conductive sheet having dipole slots therein and a transducer device operative at a wavelength different than that of the dipole slots centered on the sheet and fixed thereto and extending perpendicular to the sheet is disclosed for sensing both radio waves reflected from a target and infrared or other rays emanating from the target.

3,701,159

DISCONE ANTENNA

Peter Simonds, Ottawa, Ontario, Canada, assignor to Her Majesty the Queen in right of Canada as represented by the Minister of the National Defence

Filed Nov. 8, 1971, Ser. No. 196,279
Claims priority, application Canada, Dec. 18, 1970, 101,066
Int. Cl. H01q *1/36*
U.S. Cl. 343—745 **11 Claims**



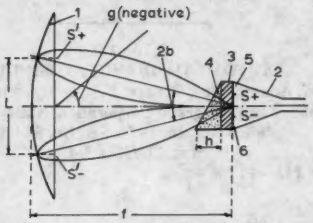
The antenna structure disclosed is of the discone type and comprises six support towers arranged at the vertices of a hexagon. Active element supporting cables extend between the towers along the sides of the hexagon. A plurality of active elements radiate outwardly from a feed point located centrally of the hexagon to terminate on the supporting cables. The supporting towers are guyed by a plurality of guys anchored at six anchor points located on lines of intersection of vertical planes through the supporting cables. The guys extend outwardly of the hexagon within these vertical planes. The supporting tower and guying arrangement is extremely simple compared to prior arrangements. Furthermore, the feed point is supported above a platform raised above actual ground level and a plurality of ground wires extend radially outward of the platform and downwardly therefrom with the major portion of their length being buried beneath the ground. This eliminates problems of high frequency noise adjacent actual ground level and also eliminates problems of wind blown refuse, snow, etc., interfering with proper operation of the antenna. The antenna may be tuned by adjusting the height of the feed point above the platform and by means of a variable capacitor in the feed line to the antenna.

3,701,160

RADAR MONOPULSE ANTENNAS WITH CONVERTING POLARIZATION

Daniel Edmond Beguin, Saint-Prix, France, assignor to International Standard Corporation, New York, N.Y.

Filed June 23, 1971, Ser. No. 155,940
Claims priority, application France, June 25, 1970, 7023592
Int. Cl. H01q *19/00*
U.S. Cl. 343—755 **8 Claims**



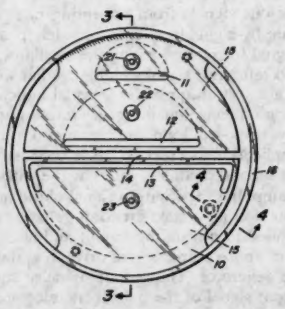
A monopulse antenna comprising an assymetrical parabolic reflector illuminated by a monopulse horn. A circular polarizing array cover adapted for selective emplacement over the horn aperture is provided. Changing from linear to circular polarization by placing the polarizer, by itself, over the horn produces an angular shift in antenna boresite (axis). A dielectric lens is provided for insertion over the polarizer to introduce a linear corrective phase shift, thereby eliminating the said axis shift.

3,701,161

FOUR BAND SLOT ANTENNA

Benjamin F. Gregory, China Lake, Calif., assignor to Trak Microwave Corporation, Tampa, Fla.

Filed May 11, 1970, Ser. No. 36,160
Int. Cl. H01q *13/10*
U.S. Cl. 343—770 **6 Claims**



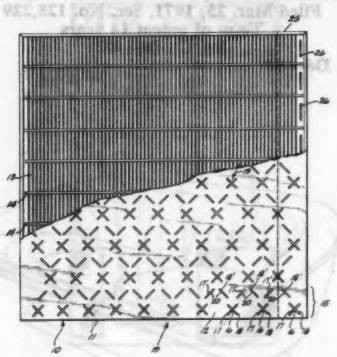
A multiple radiator microwave antenna comprising four separate discretely tuned cavity-backed slot antennas for providing a unidirectional radiated RF energy field in a narrow beam along a common axis at four discrete frequencies.

3,701,162

PLANAR ANTENNA ARRAY

Arthur F. Seaton, Palos Verdes Estates, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed March 24, 1964, Ser. No. 354,341
Int. Cl. H01q *13/10*
U.S. Cl. 343—771 11 Claims



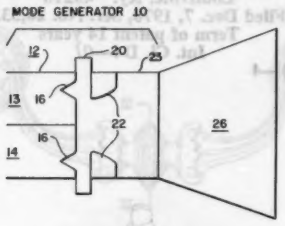
A circularly polarized planar array of slot antenna elements provide a pencil-beam pattern substantially perpendicular to the plane of the array.

3,701,163

MULTI-MODE, MONOPULSE FEED SYSTEM

Joseph P. Grabowski, Willingboro, N.J., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 9, 1971, Ser. No. 196,925
Int. Cl. H01q *13/00*
U.S. Cl. 343—786 9 Claims



A wide band multi-mode feed device, capable of propagating a TE_{10} and a hybrid shaping mode is provided. A narrow ridge hybrid mode generator, disposed between a mode cavity and a mode phasor, controls a sum pattern E-plane shaping mode. The narrow ridge provides only a negligible coupling to the TE_{20} mode since the narrow ridges are placed only in the null regions of the TE_{20} mode. The mode cavity and an inverse mode launcher control unwanted cross polarization resulting from the TE_{11} and TM_{11} modes. This device is most useful for high efficiency monopulse antenna systems and especially for systems where the accurate gathering and analysis of tracking data is a prime requisite.

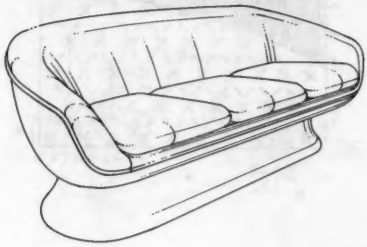
DESIGNS

OCTOBER 24, 1972

224,949
BROOM COVER
Mary J. Schildknecht, 6202 Upper Hunter Trace Road, Louisville, Ky. 40216
Filed Dec. 7, 1970, Ser. No. 26,333
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—4

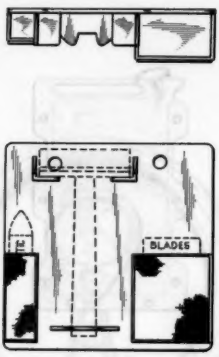
224,950
ROCKING CHAIR
Paavo Gunnar Nuortie, 54 Kalevankatu C, Helsinki, Finland
Filed Oct. 7, 1968, Ser. No. 13,871
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—50

224,951
SOFA
Robert L. Wilson, Senatobia, Miss., assignor to Chromcraft Corporation, Amsterdam, N.Y.
Filed Mar. 25, 1971, Ser. No. 128,229
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—63

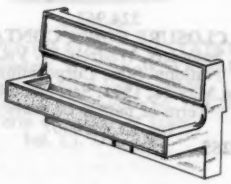


224,952
CHAIR
Robert L. Wilson, Senatobia, Miss., assignor to Chromcraft Corporation, Amsterdam, N.Y.
Filed Mar. 25, 1971, Ser. No. 128,228
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—75

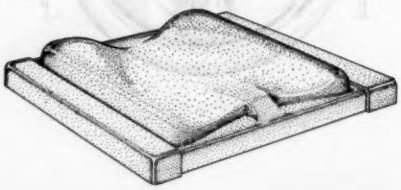
224,953
SHAVING CADDY
John C. Stephenson, 1257 Armacost Ave., Los Angeles, Calif. 90025
Filed May 25, 1971, Ser. No. 146,856
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—88



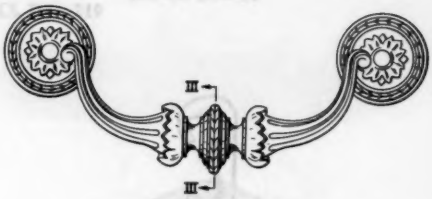
224,954
FACE PANEL FOR A CARD CATALOG DRAWER
Stephen F. McKeon, Utica, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Jan. 19, 1971, Ser. No. 107,878
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—192



224,955
STADIUM SEAT OR SIMILAR ARTICLE
Max E. Tipton, Easton, Pa., assignor to Seating Company of America Inc., Easton, Pa.
Filed Dec. 18, 1970, Ser. No. 26,556
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—197

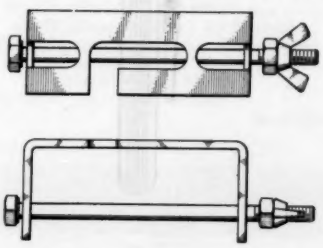


224,956
DRAWER PULL
William Doyle Watt, Jr., Grand Rapids, Mich., assignor to Keeler Brass Company, Grand Rapids, Mich.
Filed June 25, 1971, Ser. No. 157,070
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—171



224,957
RING TRAVELER
Charles H. Dauray, Seekonk, and George F. Bliss, East Douglas, Mass., assignors to U.S. Ring Traveler Company, Cranston, R.I.
Filed Oct. 12, 1971, Ser. No. 188,659
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—248

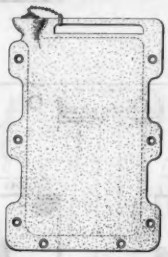
224,958
SAFETY HANGER FOR TENSION SPRINGS
Richard D. Smith, 127 16th St., Boone, Iowa 50036, and Ronald S. Du Bois, 790 Spalding, Thousand Oaks, Calif. 91360
Filed Aug. 6, 1970, Ser. No. 24,357
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—263



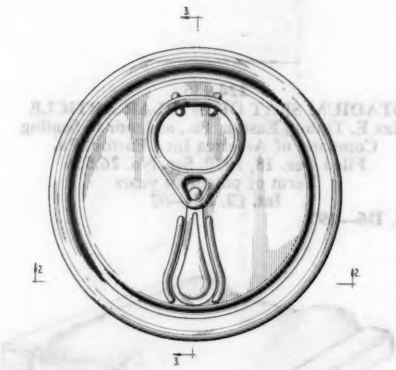
224,959
RING TRAVELER
Charles H. Dauray, Seekonk, and George F. Bliss, Worcester, Mass., assignors to U.S. Ring Traveler Company, Cranston, R.I.
Filed Oct. 12, 1971, Ser. No. 188,658
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—248

224,960
RETAINING STRAP FOR ELECTRICAL CABLES
Robert William Wilson, Northel House, Wenlock Way, England
Filed Nov. 30, 1970, Ser. No. 26,218
Term of patent 14 years
Int. Cl. D9—*06*
U.S. Cl. D9—252

224,961
FLEXIBLE BAG FOR LIQUID STORAGE
Kenneth D. Sears, Box 225, West Yellowstone, Mont. 59758
Filed Apr. 15, 1971, Ser. No. 134,546
Term of patent 14 years
Int. Cl. D9—*02;* D24—*04*
U.S. Cl. D9—182



224,962
END CLOSURE FOR A CONTAINER
William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation
Filed May 26, 1971, Ser. No. 147,287
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—255



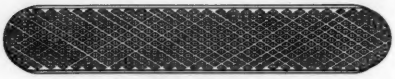
224,963
END CLOSURE FOR A CONTAINER
William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation
Filed May 26, 1971, Ser. No. 147,288
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—255

224,964
TAB OPENER FOR A CONTAINER
William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation
Filed May 26, 1971, Ser. No. 147,289
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—256

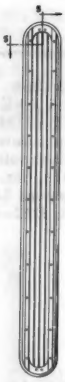
224,965
MOLDED PACKAGING TRAY FOR MEAT OR THE LIKE
Richard F. Reifers, New Canaan, Conn., and Kenneth D. Bixler, Huntington, N.Y., assignors to Diamond International Corporation, New York, N.Y.
Filed Jan. 27, 1971, Ser. No. 110,351
Term of patent 14 years
The portion of the term of the patent subsequent to Aug. 29, 1986, has been disclaimed
Int. Cl. D9—*03*
U.S. Cl. D9—219

224,966
BACKUP PLATE FOR A PNEUMATIC VEHICLE IMPACT BUMPER
Wilbur L. Hiatt, 4508 Commonwealth Drive, Williamsburg Apt. N., Indianapolis, Ind. 46220
Filed May 6, 1971, Ser. No. 141,078
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6

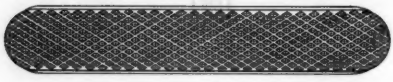
224,967
PNEUMATIC VEHICLE IMPACT BUMPER
Wilbur L. Hiatt, 4508 Commonwealth Drive, Williamsburg Apt. N., Indianapolis, Ind. 46220
Filed May 6, 1971, Ser. No. 141,079
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6



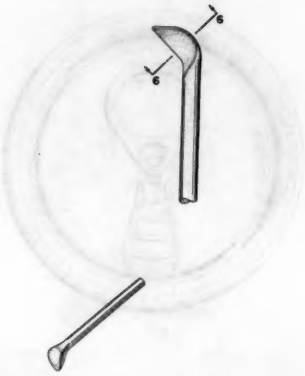
224,968
MOUNTING PLATE FOR A PNEUMATIC VEHICLE IMPACT BUMPER
Wilbur L. Hiatt, 4508 Commonwealth Drive, Williamsburg Apt. N., Indianapolis, Ind. 46220
Filed May 6, 1971, Ser. No. 141,076
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6



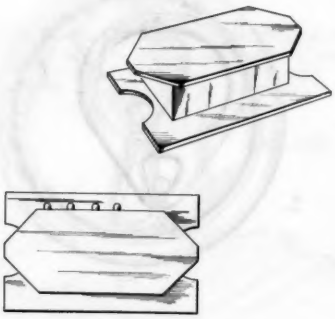
224,969
CASING FOR A PNEUMATIC VEHICLE IMPACT BUMPER
Wilbur L. Hiatt, 4508 Commonwealth Drive, Williamsburg Apt. N., Indianapolis, Ind. 46220
Filed May 6, 1971, Ser. No. 141,077
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6



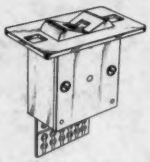
224,970
DENTAL RETAINER CLASP
Dennis M. Burnett, 6231 Hillside Drive, El Sobrante, Calif. 94803
Filed Dec. 7, 1970, Ser. No. 26,328
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1

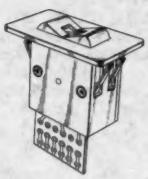


224,971
POWER SUPPLY REGULATOR
Richard Projain, Syosset, and Robert Gold, St. James, N.Y., assignors to Lamda Electronics Corporation, Huntington, N.Y.
Filed Mar. 4, 1971, Ser. No. 121,228
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—15

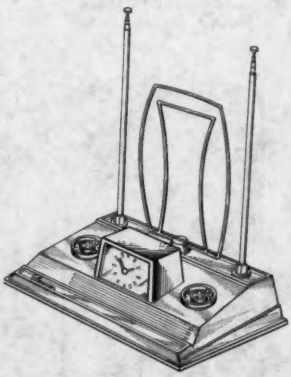


224,972
DIGITAL SWITCH
Hiroji Fujimoto, Kanagawa, Japan, assignor to Fujisoku Electric Co., Ltd., Kanagawa-ken, Japan
Filed Mar. 18, 1971, Ser. No. 125,925
Claims priority, application Japan Oct. 30, 1970
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

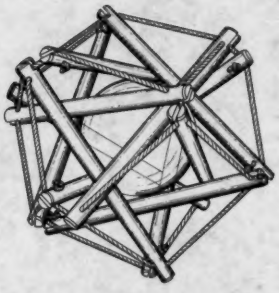




224,973
COMBINED CLOCK AND INDOOR TELEVISION ANTENNA
John Franzone, 2301 York Road, Timonium, Md. 21093
Filed June 3, 1971, Ser. No. 149,874
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

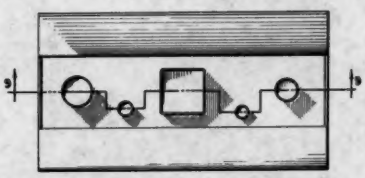


224,974
GAME PUZZLE
Geoffrey A. Mogilner, 2070 California St., San Diego, Calif. 92110, and Rodney D. Johnson, San Diego, Calif.; said Johnson assignor to said Mogilner
Filed Dec. 7, 1970, Ser. No. 26,312
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

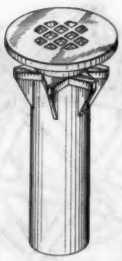


224,975
UNCOUPLING DEVICE FOR TOY RAILROAD CARS
Earl W. Harding, 220 N. Montebello Blvd., Montebello, Calif. 90640
Filed Apr. 19, 1971, Ser. No. 135,528
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

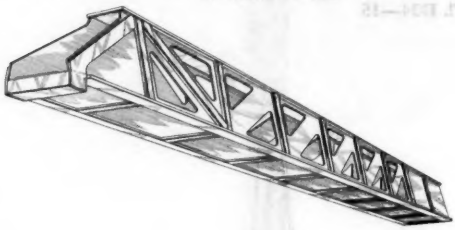
224,976
GAME TARGET BOX
Milo W. Klingerman, 2807 W. Wyoming St., Indianapolis, Ind. 46221
Filed Jan. 29, 1971, Ser. No. 111,176
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



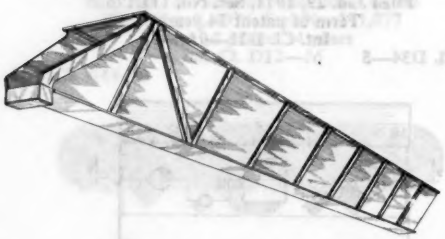
224,977
CASING FOR TOY VOICE
Joseph Lieberman, % The Fry-Lieb Co., Inc., 487 Broadway, Brooklyn, N.Y. 10013
Filed Mar. 19, 1971, Ser. No. 126,396
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



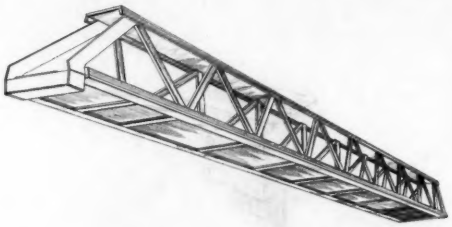
224,978
CANTILEVERED CRANE BOOM SECTION
Russell L. Sterner, Greencastle, Pa., assignor to Walter Kidde & Company, Inc., Clifton, N.J.
Filed June 25, 1971, Ser. No. 157,073
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D41—1



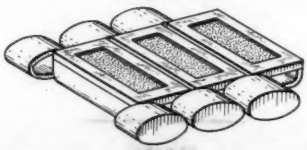
224,979
SECTION FOR A TELESCOPING CRANE BOOM
Russell L. Sterner, Greencastle, Pa., assignor to Walter Kidde & Company, Inc., Clifton, N.J.
Filed June 25, 1971, Ser. No. 157,074
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D41—1



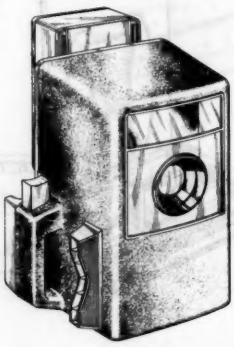
224,980
BOOM SECTION FOR A CANTILEVERED CRANE BOOM
Russell L. Sterner, Greencastle, Pa., assignor to Walter Kidde & Company, Inc., Clifton, N.J.
Filed June 25, 1971, Ser. No. 157,072
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D41—1



224,981
LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE
Yuen Sang Poon, Hong Kong, assignor to Yuen Sang Hardware Co., Ltd., Hong Kong
Filed Nov. 13, 1970, Ser. No. 25,967
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4



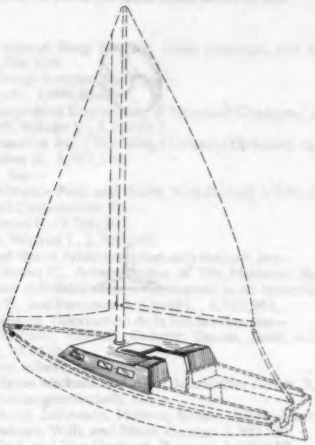
224,982
PHOTOGRAPHIC CAMERA
James M. Conner, Mamaroneck, N.Y., assignor to Polaroid Corporation, Cambridge, Mass.
Filed June 17, 1971, Ser. No. 154,258
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1



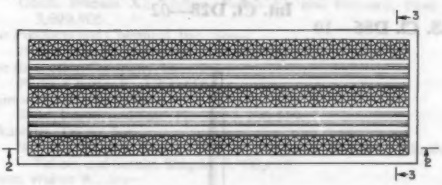
224,983
PADDLE
Hugh R. Bolen, Jr., Box 313, RFD 5, Lexington, Va. 24450
Filed Nov. 2, 1970, Ser. No. 25,790
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D71—1

224,984
CABIN FOR A HELICOPTER
Buford J. Schramm, Tempe, Ariz., assignor to Rotoway, Inc., Tempe, Ariz.
Filed Mar. 4, 1971, Ser. No. 121,225
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1

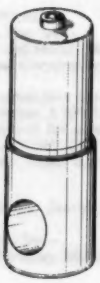
224,985
CABIN FOR SAILBOAT OR THE LIKE
Andrew T. Kostanecki, New Canaan, Conn., assignor to Bangor Punta Operations, Inc., Greenwich, Conn.
Filed Sept. 8, 1970, Ser. No. 24,863
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



224,986
COMBINED REFLECTOR AND LENS
Sidney A. Heenan, Park Ridge, Ill., assignor to Amerace Esna Corporation, New York, N.Y.
Filed June 9, 1971, Ser. No. 151,611
Term of patent 14 years
Int. Cl. D29—*99*; D26—*99*
U.S. Cl. D72—1



224,987
OXYGEN SENSOR
Stephens N. Sato, San Diego, Calif., assignor to Ivac Corporation, San Diego, Calif.
Filed Nov. 1, 1971, Ser. No. 194,777
Term of patent 14 years
Int. Cl. D24—*01, 99*
U.S. Cl. D83—1

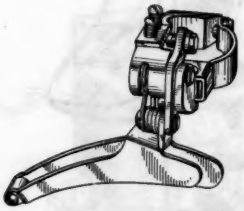


224,988
DISPOSABLE STETHOSCOPE TRANSDUCER
Sydney Hudspith, San Diego, Calif., assignor to Ivac Corporation, San Diego, Calif.
Filed Nov. 1, 1971, Ser. No. 194,775
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12

224,989
SWAB FOR COSMETIC APPLICATION
Allan A. Costa, 682 Udall Road, West Islip, N.Y., and Helmut Michel, Hillfield, Mount Park, Harrow-on-the-Hill, Middlesex, England
Filed July 16, 1969, Ser. No. 18,232
Term of patent 14 years
Int. Cl. D28—*02*
U.S. Cl. D86—10

224,990
FOLDED UMBRELLA
Robert Brooks, Great Neck, N.Y., assignor to The L. P. Henryson Co., Inc., New York, N.Y.
Filed Dec. 2, 1970, Ser. No. 26,259
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3

224,991
BICYCLE CHAIN WHEEL SHIFTER
Lucien Charles Hippolye Juy, 75 Rue General Fauconnet, Dijon, France
Filed Apr. 15, 1971, Ser. No. 134,544
Claims priority, application France Oct. 16, 1970
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D90—1



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF OCTOBER, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aagaard, Einar Andreas; Greeekes, Johannes Anton; and Van Den Enden, Adrianus Wilhelmus Maria, to U.S. Philips Corporation. Hybrid circuit. 3,700,831, Cl. 179-176.0nc.

Aasen, Torulf F.; Mogil, Bernard; and Sepulveda, William, Jr., to Copystatics Manufacturing Corporation. Document turn-around device for copying machine. 3,700,231, Cl. 271-64.000.

AB Auto Industri: *See—*
Rex, Gert Ingmar, 3,700,183.

Abbott Coin Counter Co., Inc.: *See—*
Conant, Barton C.; and Thomas, James A. (said Conant assor. to), 3,699,981.

Abbott, Frank R., to United States of America, Navy. Ferroelectric ceramic stack. 3,700,939, Cl. 310-9.800.

Abe, Isao; Hirose, Tatsuo; and Ohshima, Kotaro, to Japan Monopoly Corporation, The and Tokyo Shibaura Electric Co., Ltd. Method for killing tobacco leaf bug inhabitants and their eggs. 3,699,976, Cl. 131-121.000.

Abe, Shigeo; and Takayama, Kenichiro. Process for producing L-valine. 3,700,556, Cl. 195-28.00r.

Abel, Edward Peter: *See—*
Brust, David Philip; Minsk, Louis Morton; and Abel, Edward Peter, 3,700,635.

Abex Corporation: *See—*
Adams, Cecil E., 3,700,396.

ABG-WERKE G.m.b.H.: *See—*
Leister, Gerhard, 3,699,855.

Abhyankar, Krishna D India: *See—*
Low, George M, Deputy Administrator of the; National Aeronautics andSpacadnistration with; respect to an invention of; Fymat, Alain L; and Abhyankar, Krishna D India, 3,700,334.

Abkowitz, Stanley; Siergiej, John M.; and Regan, Ronald D., to Abkowitz, Stanley, mesne. Titanium-nickel alloy manufacturing methods. 3,700,434, Cl. 75-214.000.

Abkowitz, Stanley, mesne: *See—*
Abkowitz, Stanley; Siergiej, John M.; and Regan, Ronald D., 3,700,434.

A.C.I. Operations Pty., Ltd.: *See—*
Barton, Patrick William, 3,700,470.

Acker, Norbert K., to Scanner, Inc. Device for machine reading of information without manipulation of the information carrier. 3,701,098, Cl. 340-146.30h.

Acle, Luis, Jr.: *See—*
Boram, William R.; and Acle, Luis, Jr., 3,700,649.

Acme Highway Products Corporation: *See—*
Wicks, Harry O., III, 3,699,853.

Acree, Elick H.; Case, Forrest Neil; and Stephens, Nancy H., to United States of America, Atomic Energy Commission. Method for mass tagging sand with a radioactive isotope. 3,700,602, Cl. 252-301.10r.

Activated Sludge Limited: *See—*
Branton, Eric Sidney, 3,700,197.

Adachi, Toshio; Hayashi, Kiyohide; and Okura, Yukio, to Daido Seiko Kabushiki Kaisha. Ingot casting apparatus. 3,700,026, Cl. 164-256.000.

Adachi, Toshio; Funakiskp, Sayoko; Furuya, Akio; and Uchida, Masakatsu, to Dai Nippon Toryo Company, Ltd. Resinous composition. 3,700,624, Cl. 260-31.600.

Adams, Albert John. Vehicle seat support. 3,700,203, Cl. 248-419.000.

Adams, Cecil E., to Abex Corporation. Electro-hydraulic flow control circuit. 3,700,396, Cl. 91-449.000.

Adams, Henry G., to International Telephone and Telegraph Corporation. Automatic direction finder. 3,701,155, Cl. 343-117.00r.

Adams, Willi: *See—*
Schruff, Horst; Lehmann, Helmut; Siefen, Jakob; Mathner, Hermann; Adams, Willi; and Weiss, Gunter, 3,700,531.

Adamski, Maximilian: *See—*
Levin, Paul; and Adamski, Maximilian, 3,699,881.

Addor, Roger Williams; and Drabb, Thomas Walter, Jr., to American Cyanamid Company. Phenylthiovinyl phosphorothioates as insecticides and acaricides. 3,700,772, Cl. 424-216.000.

Adler, Karl-Heinz; Locher, Johannes; Lemanczyk, Rudolf; and Schonart, Edgar, to Bosch, Robert, G.m.b.H. Fail-safe fuel injection control arrangement for internal combustion engines. 3,699,935, Cl. 123-102.000.

Adler, Karl-Heinz; Domann, Helmut; and Locher , Johannes, to Bosch, Robert, GmbH. Amplitude stabilized complementary transistor oscillator. 3,701,041, Cl. 331-65.000.

Adler, Robert; and Korpel, Adrianus, to Zenith Radio Corporation. Optical detecting systems for sensing variations in the lateral motion of light rays. 3,700,903, Cl. 250-217.000.

Adler, Wilfried: *See—*
Nagel, Horstmar; Berg, Markus; Lohr, Albrecht; and Adler, Wilfried, 3,700,600.

Advanced Drainage Systems, Inc.: *See—*
Sixt, Marty E., 3,699,684.

Advanced Management Engineering & Research Company: *See—*
Glissendorf, Wilmer E., 3,700,053.

Aero-Flow Dynamics, Inc. (The Wing Company Division): *See—*
Creuz, Walter R., 3,701,139.

Aerocoat S.A.: *See—*
Wanner, Maurice Paul; and Wallis, Neil Rudolf, 3,700,389.

Aerojet-General Corporation: *See—*
Depree, David O., 3,700,592.
Eggington, Wilfred J., 3,700,065.

Aeronautics and Space Administration with respect: *See—*
Fletcher, James C., Administrator of The National; Aeronautics and Space Administration with respect; to an invention of; List, William F.; and Farnsworth, David L., 3,700,961.

Agence Nationale de Valorisation de la Recherche: *See—*
Bonnier, Etienne; Allibert, Colette; Driole, Jean; and Wicker, Alain, 3,700,428.

Ager, Johnwalter Albert: *See—*
Jennings, Brian Michael; and Ager, Johnwalter Albert, 3,700,167.

Agfa-Gevaert Aktiengesellschaft: *See—*
Schruff, Horst; Lehmann, Helmut; Siefen, Jakob; Mathner, Hermann; Adams, Willi; and Weiss, Gunter, 3,700,531.
Wagner, Karl; and Von Fischern, Bernard, 3,699,857.
Winkler, Alfred, 3,699,860.

Agnew, James Malcolm, to Coal Industry (Patents) Limited. Underframes for longwall mineral mining machines. 3,700,284, Cl. 299-45.000.

Ahlquist, Norman C.: *See—*
Charlson, Robert J.; and Ahlquist, Norman C., 3,700,333.

Ahrns, Wilbur C.; Sweeney, David F.; and Dannatt, Hugh St., to Singer Company, The. Pawl actuator and locking mechanism for impact contact keyboard. 3,700,087, Cl. 197-9.00b.

Air King Corporation: *See—*
Bobrick, Mitchell, 3,700,885.

Air Preheater Company, Inc., The: *See—*
Gach, Francis X.; Fanton, Ralph E.; and Hazzard, Noel D., 3,699,905.

Air Products and Chemical, Inc.: *See—*
Beale, John H.; and Smith, William Mayo, Jr., 3,700,632.

Air Reduction Company, Inc.: *See—*
Parks, Charles F., 3,700,606.

Ajinomoto Co., Inc.: *See—*
Shiio, Isamu; and Sato, Hiroko, 3,700,559.

Akashiba, Takeo: *See—*
Suzuki, Saburo; Isono, Kiyoshi; Nagatsu, Junsaku; Akashiba, Takeo; and Sasaki, Shigeki, 3,700,655.

Aker, Walter W.: *See—*
Naydan, Theodore T.; and Aker, Walter W., 3,700,169.

Akiyama, Hideaki, to Ricoh Co., Ltd. Automatic flash bulb triggering device for use in ever-set type electronic shutter. 3,699,859, Cl. 95-11.50r.

Aktermatt, Hans, to Ciba-Geigy AG. Process for the manufacture of aminoanthraquinones. 3,700,700, Cl. 260-371.000.

Aktiebolaget Kalle-Regulatorer: *See—*
Enarsson, Knut, 3,700,246.

Aktiebolaget Svenska Flaktfabriken: *See—*
Larkfeldt, Birger, 3,699,871.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
Kuhnen, Gottfried, 3,699,641.

Alderfer, Sterling W., to Steelastic Company, The. Apparatus for producing helically formed filaments. 3,700,012, Cl. 140-149.000.

Alfa-Laval AB: *See—*
Strom, Sven O. E., 3,699,923.

Algoma Steel Corporation, The: *See—*
Nanne, Silvio Edward; and Moody, Renville O., 3,700,347.

Allam, James N., to Leesona Corporation. Chuck. 3,700,249, Cl. 279-2.000.

Allegheny Ludlum Steel Corporation: *See—*
Ramachandran, Sundaresan, 3,700,429.

Allen, William Glenn. Method for implanting natural or synthetic fibers into living tissue. 3,699,969, Cl. 128-330.000.

Allgeyer, Guy H.; and Foote, James B., to Owens-Illinois, Inc. Pallet. 3,699,902, Cl. 108-58.

Allibert, Colette: *See—*
Bonnier, Etienne; Allibert, Colette; Driole, Jean; and Wicker, Alain, 3,700,428.

Allied Chemical Corporation: *See—*
Anello, Louis G.; and Sweeney, Richard F., 3,700,646.

Kastenbein, Ernest L.; and Geltman, Gerald L., 3,700,597.
Sweeney, Richard Francis; and Yao, Charles Cheng-Yu, 3,700,733.

Allis-Chalmers Corporation: *See—*
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Boersma, Richard E., 3,700,383.
Jones, Elborn W., Jr., 3,700,256.
Scheinkoenig, Robert J.; and Haupt, Robert C., 3,700,259.

Allis-Chalmers Manufacturing Company: *See—*
Berg, David A., 3,700,044.
Garnett, Donald, 3,700,062.
Gilmore, Thomas P., 3,701,013.
Stich, Frederick A., 3,700,919.
Voth, James W., 3,699,820.

Alpha Press Electronics, Inc.: *See—*
Gruenwald, Bjorn J., 3,700,973.

Altau, Karl, to Du Pont de Nemours, E. I., and Company. Coated synthetic organic polymer fiber. 3,700,491, Cl. 117-138.8ua.

Alth, Max. Self-starting synchronous motors. 3,700,942, Cl. 310-164.000.

Alto Corporation: *See—*
Maude, Stanley Morgan, 3,700,129.

Aluminum Company of America: *See—*
Ference, Richard N.; Grega, Albert; Miller, James A.; Stewart, Ray T.; and Stricker, David M., 3,700,101.

ALZA Corporation: *See—*
Zaffaroni, Alejandro, 3,699,951.
Zaffaroni, Alejandro, 3,699,963.

Amann, Herbert; and Bader, Erich, to Asahi Glass Co., Ltd. Method for making polyoxymethylenes. 3,700,650, Cl. 260-67.0fp.

Amato, Richard A., to North American Rockwell Corporation. Electrostatos spinning head. 3,699,765, Cl. 57-58.890.

American Cyanamid Company: *See—*
Addor, Roger Williams; and Drabb, Thomas Walter, Jr., 3,700,772.
Diehl, Robert Eugene; and Magee, Richard Joseph, 3,700,674.
Haacke, Gottfried C.; and Beegle, Lindley Clair, 3,700,499.
Kunstmann, Martin Paul; and Porter, John Norman, 3,700,768.
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Murray, Robert William, 3,700,626.
Remers, William Alan; Gibs, Gabriel Joseph; and Weiss, Martin Joseph, 3,700,684.
Schmitt, Joseph Michael; Sherry, Jeffrey Rufus; and Robustelli, Albert George, 3,700,754.
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American Optical Corporation: *See—*
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American Pollution Control Corporation: *See—*
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American Spin-A-Batch Company: *See—*
Garrison, William H., 3,699,918.
Klotzbach, Kurt, 3,699,818.

American Standard Inc.: *See—*
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Ameron, Inc.: *See—*
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AMF Incorporated: *See—*
Cristiani, Athos, 3,700,141.
Heckman, Donald B., 3,701,090.
Hollenton, Frank, 3,699,977.
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Rueger, Herman; and Keller, Joseph Richard, 3,699,651.

AMP Incorporated: *See—*
Lynch, James Edward, 3,701,078.
Shughart, Mervin Leonard, 3,699,631.
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Ampex Corporation: *See—*
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Anaconda Wire and Cable Company: *See—*
Hubbard, Ronald R.; and Nalevanko, Richard N., 3,700,185.

Anderson, Alfred J.: *See—*
Hardman, Kenneth V.; and Anderson, Alfred J., 3,700,215.

Anderson, Carl M.; and Endress, James W., to Carrier Corporation. Emergency shutdown mechanism for centrifugal compressor. 3,700,355, Cl. 417-33.000.

Anderson, Howard H.; Moyer, Rudolph H.; Sibbert, Donald, J.; and Sutherland, David C., to Geomet, Incorporated. Chemiluminescence air pollutants monitoring device. 3,700,896, Cl. 250-71.00r.

Anderson, John M., to General Electric Company. Current transformers with improved coaxial feed. 3,701,003, Cl. 323-6.000.

Anderson, Paul S.: *See—*
Robinson, Franklin M.; and Anderson, Paul S., 3,700,734.

Anderson, Raymond H., Jr.; and Whiteson, Bennett V., to McDonnell Douglas Corporation. Method of increasing beryllium ductility. 3,699,798, Cl. 72-377.000.

Anderson, Robert K., to Valleylab, Inc. Electrosurgical generator. 3,699,967, Cl. 128-303.140.

Anderson, Sven; and Lombardo, Anthony, to Duplan Corporation, The, mesne. Belt looper apparatus. 3,699,907, Cl. 112-121.270.

Anderson, Willis H.: *See—*
Graddy, Willard E.; and Anderson, Willis H., 3,701,085.

Ando, Hiroyuki: *See—*
Tatematsu, Kenzo; Hosono, Hiroo; Katagiri, Toshio; Hayashi, Yoshiaki; and Ando, Hiroyuki, 3,700,818.

Andrews, Clifton B., to Protectowire Co., The. Warning system with plural identification of signalling stations. 3,701,141, Cl. 340-287.000.

Anello, Louis G.; and Sweeney, Richard F., to Allied Chemical Corporation. Polyfluoroisoalkoxy-alkyl sulfides and polysulfides. 3,700,646, Cl. 260-608.000.

Anhalt, John William, to International Telephone and Telegraph Corporation. Overriding latch mechanism. 3,699,632, Cl. 29-203.00h.

Anneberg, Vilhelm; Clemmensen, Ellen; Gudmandsen, Robert; and Scheibel, Axel, to Fonofilm Industri A/S. Magnetic stereophonic phonograph pickup. 3,700,829, Cl. 179-100.41k.

Annessa, Domenico M. Frame for a musical instrument and method of making same. 3,699,837, Cl. 84-291.000.

Anning-Johnson Company: *See—*
Craig, Robert D.; Evans, Richard O.; and Grant, Gerald F., 3,699,734.

Ansala, Vaino Toiv. Cylinder lock. 3,699,790, Cl. 70-364.00r.

Antell, Earl O.: *See—*
Lewis, J. Stephen; Sapkus, Jurgis; Antell, Earl O.; and Robson, George E., 3,699,715.

Aoki, Katashi. Method for keeping metal mold in a clamped state. 3,700,765, Cl. 264-328.000.

Aoki, Takashi: *See—*
Sato, Kazuo; and Aoki, Takashi, 3,701,151.

Aono, Shigeo; and Manaka, Nobuzi. Electrically controlled fuel injection system. 3,699,932, Cl. 123-32.0ea.

Apicella, Anthony M., Jr.; and Surprise, Jon M., to Goodyear Aerospace Corporation. Apparatus to effect improved readout of memory elements. 3,701,124, Cl. 340-174.0rc.

Applequist, James E., to Memorex Corporation. Method and circuit for driving inductive loads. 3,700,985, Cl. 317-148.50r.

Applied Power Industries, Inc.: *See—*
Sessody, Donald W., 3,700,227.

A.P.V. Company, Limited, The: *See—*
Shore, David Teignmouth; and Starkie, Granville Lewis, 3,700,468.

Aqua-Marine Mfg., Limited: *See—*
Christie, Colin McMaster, 3,700,002.

Aquila, Joseph. Towing apparatus. 3,700,125, Cl. 214-86.00a.

Archambault, Roger J., to North American Rockwell Corporation. Drafting cot assembly. 3,699,766, Cl. 57-58.910.

Ardelt, Clarence A.: *See—*
Porter, Robert B.; Ardelt, Clarence A.; and Storck, Robert C., 3,700,081.

Arents, Johannes Wilhelmus Maria, to U.S. Phillips Corporation. Method of providing a luminescent layer on a support. 3,700,479, Cl. 117-33.50l.

Aritomi, Jiro: *See—*
Kaneko, Hidehiko; Aritomi, Jiro; and Nakamura, Keiji, 3,700,680.

Arizona Chemical Company, mesne: *See—*
Wheelus, Charles Glenn, 3,700,634.

Armour & Company: *See—*
Rendek, Robert B.; and Binkerd, Evan F., 3,700,847.

Armstrong, William A.: *See—*
Titchenal, Oliver R.; and Armstrong, William A., 3,699,746.

Arnold, Loren Glenn: *See—*
Hentrich, Robert Dale; Esbeck, Howard Christian; and Arnold, Loren Glenn, 3,700,037.

Arnold, Thomas R. Modular building structure. 3,699,731, Cl. 52-64.000.

Artelt, Herbert C., Jr.: *See—*
Hutner, Mark A.; Polit, Neil A.; Watson, Donald W; and Artelt, Herbert C., Jr., 3,700,324.

Arumugham, Rangaswamy, to GTE Sylvania Incorporated. Line voltage compensating circuitry for RGB color drive system. 3,700,787, Cl. 178-5.40r.

Asahi Glass Co., Ltd.: *See—*
Amann, Herbert; and Bader, Erich, 3,700,650.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Yamaguchi, Koretaka; Toyomoto, Kazuo; and Sakamoto, Kuniaki, 3,700,755.

Asahi Kasei Kogyo Kabushiki Kaishi: *See—*
Hatayama, Takefumi; Hamano, Yoshihiko; and Yamamoto, Tsuyoshi, 3,700,572.

Asher, John W.; and Herczog, Andrew, to Corning Glass Works. Method for obtaining the dielectric constant of frit capacitors. 3,699,620, Cl. 29-25.42.

Ashikawa, Noboru; and Maruno, Fujiya, to Honda Giken Kogyo Kabushiki Kaisha. Synchromesh transmission apparatus. 3,700,083, Cl. 192-53.00f.

Ashizaki, Shigeya: *See—*
Egawa, Susumu; Ashizaki, Shigeya; Shimizu, Katsumi; and Miyati, Toshiko, 3,700,954.

Ashland Oil & Refining Company: *See*—
Robin, Michael; and Schulte, Sheldon R., 3,700,666.
Ashland Oil Inc.: *See*—
Kovach, Stephen M.; Patrick, Ralph E.; and Kmecak, Ronald A., 3,700,745.
Ashton, Harold P.: *See*—
Swett, James B.; and Ashton, Harold P., 3,700,204.
Asinger, Friedrich; Offermanns, Heribert; and Ghyczy, Mikols, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process of making thiazolines-3. 3,700,683, Cl. 260-306.700.
Asmus, Rodger W.: *See*—
Swanson, William C.; Moyer, Donald W.; and Asmus, Rodger W., 3,699,678.
Asmus, Rodger W., to International Harvester Company. Anti-coast valve addition to the manual feathering control for a hydrostatic transmission. 3,699,677, Cl. 60-53.00r.
Ateliers de Constructions Electriques de Charleroi (ACEC): *See*—
De Rubinat, Jean-Marie, 3,701,053.
Atherton, John Heathcote; and Plumb, John Beckett, to Imperial Chemical Industries Limited. Nitrogen-containing compounds. 3,700,713, Cl. 260-448.20n.
Atlantic Richfield Company: *See*—
Miles, Leon H., 3,700,050.
Atlantic Richfield Company, mesne: *See*—
Hartline, Ralph E., 3,701,005.
Atlas Chemical Industries Inc.: *See*—
Kuehn, Erich, 3,700,739.
ATM Corporation, mesne: *See*—
Schurrer, Robert L., 3,700,104.
Attia, Edward A., to Allis-Chalmers Corporation. Vacuum interrupter contacts and method for making the same. 3,700,842, Cl. 200-166.00c.
Aubry, Jean, to Societe Chimique des Charbonnages tour Aurore. Process for cyclopentadiene dimerizing. 3,700,741, Cl. 260-666.00a.
Ault, Cyrus Frank, to Bell Telephone Laboratories, Incorporated. Memory access system. 3,701,130, Cl. 340-174.10j.
Australia, Commonwealth of, care of the Secretary: *See*—
Gillard, Paul O., 3,701,134.
Avallone, Samuel C., to United States Steel Corporation. Bright-finish welding wire. 3,700,494, Cl. 117-202.000.
Avco Corporation: *See*—
Kaiser, Robert, 3,700,595.
Avesta Jernverks Aktiebolag: *See*—
Bjorkroth, Jarl A., 3,700,851.
Babcock & Wilson Company, The: *See*—
Schluderberg, Donald C., 3,700,552.
Babson, Edward S., to USM Corporation. Dust removal means. 3,699,597, Cl. 12-89.000.
Bacher, Elisabeth: *See*—
Furst, Andor; Muller, Marcel; Muller, Peter; Schocher, Arne Johannes; and Bacher, Elisabeth, 3,700,702.
Bader, Erich: *See*—
Amann, Herbert; and Bader, Erich, 3,700,650.
Badger Northland, Inc.: *See*—
Janssen, Gail E.; and Wildenberg, Henry N., 3,699,732.
Badowski, Charles: *See*—
Dostal, Frank; and Badowski, Charles, 3,700,304.
Bagguley, Richard B., to Continental Can Company, Inc. Threaded safety closure. 3,700,133, Cl. 215-9.000.
Bailey, Denis M., to Sterling Drug Inc. (2,3-Dihydro-2-benzofuranyl-methyl) guanidines and their preparation. 3,700,697, Cl. 260-346.20r.
Baisz, George J.; and Shonka, Francis R.; deceased (by Shonka, Louis M.; administratrix), to United States of America, Atomic Energy Commission. Miniature coaxial cable connector. 3,701,080, Cl. 339-48.000.
Baker, Alfred Dickens, to Lucas, Joseph, (Industries) Limited. Lighting systems for road vehicles. 3,700,878, Cl. 240-7.1lj.
Baker Perkins Inc.: *See*—
Mc Manus, Lynn S., 3,700,121.
Baldwin, Kenneth B.; and Sullivan, Ronald D., to Bourns, Inc. Wormagear actuated pontentiometer. 3,701,070, Cl. 338-162.000.
Ball, Billie Joe: *See*—
Knowles, James H.; Ball, Billie Joe; and Fitzgerald, Donald F., 3,701,024.
Ballantine Laboratories, Inc., mesne: *See*—
Cannara, Alexander B., 3,701,142.
Baltimore Aircoil Company, Inc.: *See*—
Engalitcheff, John, Jr., 3,700,110.
Baltz, George W. Liquid level device. 3,699,661, Cl. 33-377.000.
Balz, Helmut, GmbH, Firma: *See*—
Balz, Jurgen, 3,700,085.
Balz, Jurgen, to Balz, Helmut, GmbH, Firma. Motor driven positioning apparatus with force-controlled shutoff switches. 3,700,085, Cl. 192-141.000.
Bandelier, Edouard: *See*—
Piquerez, Ervin, 3,699,767.
Bang, Veron E.: *See*—
Brown, William R.; Bang, Veron E.; and Brown, William R., 3,700,838.
Baranauckas, Charles F.: *See*—
Carr, Russell L. K.; and Baranauckas, Charles F., 3,700,695.
Baranowski, Frank, Jr. Calibrated pressure regular. 3,699,998, Cl. 137-327.000.
Barber-Greene Company: *See*—
Dediemar, Ronald B.; and Schuman, Leroy J., 3,700,182.
Bard, C. R., Inc.: *See*—
Ericson, Richard E., 3,699,964.
Bardos, John J.; and Poplawski, Joel J., to International Harvester Company. Hydraulic brake adjustor and equalizer. 3,699,679, Cl. 60-54.50e.
Bare, Thomas M.: *See*—
Suh, John T.; and Bare, Thomas M., 3,700,692.
Barker, James F.: *See*—
Hoppin, George S., III; Yount, Reed E.; Berry, Thomas F.; and Barker, James F., 3,700,427.
Barkovitz, William E., to American Radiator & Standard Sanitary Corporation. Wet scrubber dust collector. 3,699,748, Cl. 55-223.000.
Barrett, John C.; Borden, Howard C.; and Loebner, Egon E., to Hewlett Packard Company. Hybrid integrated circuit module. 3,701,123, Cl. 340-173.01s.
Barth, Wayne E., to Pfizer, Inc. 2-Hydroxymethy1-3-hydroxy-6-(hydroxy-2-aminoethyl) Pyridines. 3,700,681, Cl. 260-296.0ae.
Bartilson, Benjamin M.; and Francis, Gerald A., to United States of America, Army. Wire tying apparatus including demountable tying mechanism. 3,700,010, Cl. 140-93.00a.
Bartlemay, James M.: *See*—
Charters, Robert L.; Bartlemay, James M.; Folline, John M.; and Donich, Thomas G., 3,701,120.
Bartlett, Joseph E. Washer replacement assembly for faucet valves. 3,700,207, Cl. 251-88.000.
Barton, Patrick William, to A.C.I. Operations Pty., Ltd. Foamed ceramic material and method of making the same. 3,700,470, Cl. 206-25.00.
Bartram, Michael J.: *See*—
Mortimer, Frank R.; Brewster, Alan R.; and Bartram, Michael J., 3,700,075.
Basche, Malcolm: *See*—
Veltri, Richard D.; Merriam, Asaph U.; and Basche, Malcolm, 3,700,486.
Basic Packaging Systems, Inc.: *See*—
Titchenal, Oliver R.; and Armstrong, William A., 3,699,746.
Basso, Eugenio; Ravaschio, Guglielmo; and Frangilli, Vittorio, to Fabbrica Italiana Magneti Marelli S.p.A. Electronic device for regulating the voltage of alternators, particularly for motor vehicles. 3,701,000, Cl. 320-64.000.
Batchelor, Gordon S.; and Nixon, Dalbro R., to Virginia Chemicals Inc. Adjustable aerosol can support. 3,700,200, Cl. 248-312.000.
Bates, Reginald A., to Pass & Seymour, Inc. Wire operated remote control system. 3,700,972, Cl. 317-137.000.
Batt, Robert S., to Torrington Company Limited, The. Rolling bearings. 3,700,299, Cl. 308-212.000.
Battaerd, Hendrik A. J.: *See*—
Tregear, Geoffrey W.; Battaerd, Hendrik A. J.; Lang, Gunter A.; Catt, Kevin; and Niall, Hugh D., 3,700,609.
Battelle Development Corporation, The, mesne: *See*—
Charlson, Robert J.; and Ahlquist, Norman C., 3,700,333.
Bauer, George J. Fisherman 's knot tying device. 3,700,272, Cl. 289-17.000.
Baumanis, Bruno, to Molex Incorporated. Electrical connector. 3,701,082, Cl. 339-61.00m.
Bautz, Fred H., to Continental Can Company, Inc. Gripping type compound applying chuck assembly. 3,700,250, Cl. 279-35.000.
Baxter, Calvin J.; and Thomas, McKinley B., to United States Steel Corporation. Pipe slitting machine. 3,700,222, Cl. 266-23.00k.
Baychem Corporation, mesne: *See*—
Persin, William J., 3,700,287.
Bayre, Willard W., to General Motors Corporation. Ultrasonic testing apparatus. 3,699,805, Cl. 73-67.600.
BDH Pharmaceuticals Limited: *See*—
Bysouth, Peter Thomas; and Wild, Anthony Musgrave, 3,700,738.
Beale, John H.; and Smith, William Mayo, Jr., to Air Products and Chemical, Inc. Readily extruded chlorinated copolymers and process of preparing same. 3,700,632, Cl. 260-87.50c.
Beaman, Alden Gamaliel; Duschinsky, Robert; and Tautz, William Paul, to Hoffmann-La Roche Inc. 1,2-Epoxy-3-(3-iodo-2-propynyloxy)-propane. 3,700,698, Cl. 260-348.00r.
Beans, Allen F.: *See*—
Gagliardi, Richard P.; Beans, Allen F.; Eddowes, Alfred M.; and Greenblatt, Herbert, 3,701,153.
Beasley, George A., to Itek Corporation. Grinding pad. 3,699,721, Cl. 51-209.0dl.
Beasley, Noel F.: *See*—
Handler, Elliot; Beasley, Noel F.; Garcia, Armando J.; and May, Richard L., 3,699,712.
Beaton, Joseph R. Hydraulic boom for earth excavating apparatus. 3,700,126, Cl. 214-141.000.
Beck, Eugene F. Hydraulic system. 3,699,676, Cl. 60-52.00s.
Beck, Louis. Airless spray gun extension. 3,700,174, Cl. 239-526.000.
Beck, Otto; and Spalding, Georg, to Hesser, Fr., Maschinenfabrik, A.G. Drive for a moving welding apparatus. 3,700,854, Cl. 219-243.000.
Becker, Rudolf, to Linde Aktiengesellschaft. Process of separating air into an oxygen-rich fraction suitable for blast furnace operation. 3,699,695, Cl. 62-13.000.
Beckley, Gary H.: *See*—
Davin, Donald R.; and Beckley, Gary H., 3,700,288.
Beckwith, Robert C.: *See*—
Hecker, Robert W., Jr.; and Beckwith, Robert C., 3,699,601.
Bederke, Klaus: *See*—

Gentsch, Erich; Bederke, Klaus; Seider, Walter; Fullner, Hans Jurgen; and Muhlmann, Christa, 3,700,483.

Beegle, Lindley Clair: *See*—
Haacke, Gottfried C.; and Beegle, Lindley Clair, 3,700,499.

Beehler, Larry A.; and Templin, Jackson R., to General Motors Corporation. Thumbwheel vacuum thermostat. 3,700,165, Cl. 236-13.000.

Beers, Melvin D.: *See*—
Hamilton, Stephen B.; Beers, Melvin D.; and Berger, Abe, 3,700,714.

Beguin, Daniel Edmond, to International Standard Corporation. Radar monopulse antennas with converting polarization. 3,701,160, Cl. 343-755.000.

Behme, Henning, to Kieserling, Th., & Albrecht Werkzeugmaschinenfabrik. Device for conveying fluids or electric current between a stationary source and a mobile consumer. 3,700,833, Cl. 191-12.00r.

Behrenz, Wolfgang: *See*—
Fest, Christa; Hammann, Ingeborg; and Behrenz, Wolfgang, 3,700,686.

Behring Corporation: *See*—
Gollobitz, Gregory N., 3,699,628.

Beigel, Raymond J. Foldable container and blanks therefor. 3,700,159, Cl. 229-19.000.

Belasco, Melvin; and Borrello, Sebastian R., to Texas Instruments, Incorporated. Schottky barrier phototransistor. 3,700,980, Cl. 317-235.00r.

Belcher, Richard A., to Chase-Shawmut Company , The. Electric cartridge fuse. 3,701,069, Cl. 337-160.000.

Bell & Howell Company: *See*—
Bernhold, Edward B., 3,700,315.
Koeber, Henry J., 3,700,317.

Bell Canada: *See*—
Naylor, David C.; and Leyburn, Derek, 3,700,830.

Bell Telephone Laboratories, Inc.: *See*—
Beurrier, Henry Richard, 3,700,832.
Laane, Rein Raymond, 3,701,017.
Markevich, John Anthony, 3,701,028.
Newby, Kenneth Russ; and Turner, Dennis Robert, 3,700,569.
Paoli, Thomas Lee; and Ripper, Jose Ellis, 3,701,044.
White, Gerard, 3,701,033.

Bell Telephone Laboratories, Incorporated: *See*—
Ault, Cyrus Frank, 3,701,130.
Bodeck, Andrew Henry; and Levinstein, Hyman Joseph, 3,701,127.
Bonyhard, Peter Istvan; and Nelson, Terence John, 3,701,132.
Borsuk, Michael Howard; and Ritsopoulos, Sotirios Constantine, 3,700,793.
Brandes, Raymond G.; and Pleass, Charles M., 3,700,857.
Bryant, Herbert William, 3,700,938.
Butherus, Alexander Duane; and Newby, Kenneth Russ, 3,700,975.
Copeland, John Alexander, III., 3,701,128.
Copeland, John Alexander, III., 3,701,129.
Dalley, James Edwin, 3,700,926.
Dalley, James Edwin; and Tsao-Wu, Nelson Tsin, 3,700,927.
Doddington, George Rowland; Flanagan, James Loton; and Lummis, Robert Carl, 3,700,815.
Fraser, David Bruce, 3,701,121.
Fritschi, Walter William, 3,700,822.
Geusic, Joseph Edward; Nelson, Terence John; and Schinke, David Paul, 3,701,122.
Glass, Alastair Malcolm; and Peterson, George Earl, 3,700,912.
Hagelbarger, David William, 3,701,112.
Heightley, John Donnell, 3,700,874.
Hunter, Paul Douglas; and Machol, Richard Erving, Jr., 3,701,096.
Irish, Carleton D., 3,701,076.
Kahng, Dawon, 3,700,932.
Kreuzer, Lloyd Barton, 3,700,890.
Marcus, Michael Jay, 3,700,819.
North, James Clayton; and Pruniaux, Bernard Roger, 3,700,978.
Okinaka, Uutaka, 3,700,469.
Peters, Theodore Richmond, 3,701,109.
Savage, Bruce Russell, 3,700,821.
Waaben, Sigurd Gunther; and Weiss, Walter Ira, 3,701,119.

Bell, William A., Jr.; and Veach, Allen M., to United States of America, Atomic Energy Commission. Separation of mercury isotopes. 3,700,892, Cl. 250-41.90s.

Bellinger, Robert M.; and Cabbage, John T., to Phillips Petroleum Company. Biphenyl purification process by plural stage fractional distillation. 3,700,566, Cl. 203-1.000.

Bellware, James D., to General Motors Corporation. Depressed park windshield wiper. 3,699,605, Cl. 15-250.170.

Belton, John Price, Jr., to Bunker-Ramo Corporation. Digital frequency synthesizer. 3,701,027, Cl. 328-17.000.

Bendix Corporation, The: *See*—
Bode, James Daniel, 3,700,111.
Eyler, Francis R., 3,700,920.
Giardini, Dante S.; and Chhabra, Indarmohan S., 3,699,728.
Goodrich, George W.; Colson, William B.; and Matle, Calvin C., 3,700,947.
Greene, William H., 3,699,915.
Thomas, Neal C., 3,700,097.
Verge, Kenneth W.; Kachman, Robert D.; and Read, Ronald G., 3,700,362.

Benghiat, Isaac, to Universal Oil Products Company. Diesters of halo-substituted alkyloxyalkylphosphonates. 3,700,760, Cl. 260-950.000.

Bennethum, James E., to General Motors Corporation. Stirling engine control system. 3,699,770, Cl. 60-24.000.

Bennethum, James E., to General Motors Corporation. Rotary combustion engine. 3,699,929, Cl. 123-8.090.

Bennett, Leonard W.; Hutchinson, Thomas R.; and Schilling, Winston H., to Motorola, Inc. Miniature transmitter receiver housing. 3,701,016, Cl. 325-16.000.

Bentvelzen, Joseph Maria; and Millington, Alan Dennis, to Consolidated Papers, Limited. Tape reinforced laminated product. 3,700,536, Cl. 161-57.000.

Berentzen, Hardo, to Groz, Theodor, and and Sohne and Ernest Beckert Nadelfabrik Commandit-Gesellschaft. Latch needle for knitting machines. 3,699,784, Cl. 66-123.000.

Berg, David A., to Allis-Chalmers Manufacturing Company. Hydraulic system for controlling bulldozer blade. 3,700,044, Cl. 172-804.000.

Berg Electronics, Inc.: *See*—
Landman, Dirk, 3,701,071.

Berg, Markus: *See*—
Nagel, Horstmar; Berg, Markus; Lohr, Albrecht; and Adler, Wilfried, 3,700,600.

Berger, Abe: *See*—
Hamilton, Stephen B.; Beers, Melvin D.; and Berger, Abe, 3,700,714.

Berger, Abe; and Selin, Terry G., to General Electric Company. Silicone compounds containing hydrazone functional groups thereon. 3,700,711, Cl. 260-448.80r.

Berger, Abe, to General Electric Company. Polyaminoalkylthioalkyl silanes. 3,700,715, Cl. 260-448.80r.

Berger, Abe; and Selin, Terry G., to General Electric Company. Amino-functional silane compounds. 3,700,716, Cl. 260-448.20n.

Berger, Charles V.; and Broghton, Donald B., to Universal Oil Products Company. Simultaneous recovery and production of pure xylenes from AC atomic mixture. 3,700,744, Cl. 260-668.00a.

Bergeron, Robert J.; and Schlichter, Stephen L., to Procter and Gamble Company, The. Method of making coffee extract. 3,700,466, Cl. 99-71.000.

Bergin, William P., to Honeywell Inc. Analog to digital converter. 3,701,145, Cl. 340-347.0nt.

Bergomi, Joseph G., Jr., to Monsanto Company. Coated substrate. 3,700,492, Cl. 117-155.0ua.

Bergwerksverband G.m.b.H.: *See*—
Karweil, Joachim; and Degel, Josef, 3,700,563.

Berman, Elliot: *See*—
McLeod, Gerald L.; French, Hollis E.; Case,Laura K.; Berman, Elliot; and Casella, Joseph, 3,700,440.
Ravich, Leonard E.; Berman, Elliot; and Ekman, Carl F. W., 3,700,447.

Berman, Max; and Bowen, Gary W., to General Electric Company. Noise error correcting and excessive noise rejecting system. 3,701,102, Cl. 340-168.00r.

Bernard, Henri Gabriel. Electric connector device. 3,701,087, Cl. 339-198.00g.

Berndt, Hans Detlef; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Process for making Δ^5 (10)-estrenes or pregnenes and products obtained thereby. 3,700,670, Cl. 260-239.55r.

Bernhold, Edward B., to Bell & Howell Company. Autmatic speed control for movie projector. 3,700,315, Cl. 352-17.000.

Berry, David A.; and Gynn, Gilbert M., to Dart Industries, Inc. Filled compositions containing 3,9-divinyl spirobi. 3,700,613, Cl. 260-17.4cl.

Berry, Thomas F.: *See*—
Hoppin, George S., III; Yount, Reed E.; Berry, Thomas F.; and Barker, James F., 3,700,427.

Bertea Corporation: *See*—
Stevens, Curtis E.; and Phillips, Chandler A., 3,701,136.

Bertele, Ludwig, to Wild Heerbrugg AG, Firma. Wide-angle objective. 3,700,312, Cl. 350-215.000.

Bethlehem Steel Corporation: *See*—
Estes, John C., 3,699,688.
Roberts, Carlton E.; Rahn, Hilton N., Jr.; and Reid, Walter E., Jr., 3,700,504.
Scales, Ralph E.; and Whitley, James O., Jr., 3,700,014.

Beurrier, Henry Richard, to Bell Telephone Laboratories, Inc. N-port circulator. 3,700,832, Cl. 179-170.0nc.

Bevan, Ronald: *See*—
Clarke, Kenneth; and Bevan, Ronald, 3,699,621.

Bezemer, Cornelis; Tadema, Harco J.; and Houbolt, Jacob J.H.C., to Shell Oil Company. Apparatus and method for removing oil products floating on water. 3,700,593, Cl. 210-40.000.

Biagi, Alvaro D.; and D'Amato, Sirio S., to Republic Electronics Industries Corporation. Probe containing diode assembly for radio frequency peak power detection. 3,701,011, Cl. 324-72.500.

Bicher, Haim I., to Transidyne General Corporation. Blood cell aggregometer. 3,700,408, Cl. 23-230.00b.

Bichsel, Stanley E.; and Carpenter, Tim D., to Holly Sugar Corporation. Ion exchange treatment of sugar containing solutions and production of a liquid fertilizer. 3,700,460, Cl. 99-2.000.

Bidault, Michel; Dosdat, Jean; Lelay, Roland; and Parouty, Jran Claude, to Compagnie Francaise Thomson Houston-Hotchkiss Brandt. Method of manufacturing long length composite superconductors. 3,699,647, Cl. 29-599.000.

Biecker, Thomas C. Puppet theater. 3,699,703, Cl. 46-13.000.

Bienert, Klaus; Lang, Winfried; Nordt, Egon; and Weidner, Herbert, to Wacker-Chemitronic Gesellschaft fur Elektronik. Process for making extra-pure arsenic by sublimation in the presence of carbon or boron. 3,700,413, Cl. 23-294.000.

Bilinski, Donald J.; and Weisbord, Leon, to Singer Company, The, mesne. Flexure hinge assembly. 3,700,289, Cl. 308-2.00a.

Billon, Gerard; Henry, Jean Claude; and Vincent, Eugene, to Gerin, Merlin. Differential valve safety device for compressed gas circuit interrupters. 3,700,848, Cl. 200-148.00r.

Binek, Bedrich: *See*—
Dohnalova-Binkova, Blanka; and Binek, Bedrich, 3,700,170.

Bingham, Wallace Karl, to Minnesota Mining and Manufacturing Company. Retroreflective microspheres having a dielectric mirror on a portion of their surface and retroreflective constructions containing such microsphers. 3,700,305, Cl. 350-105.000.

Bingham, Wallace Karl, to Minnesota Mining and Manufacturing Company. Microspheres having an antireflection coating and their use. 3,700,478, Cl. 117-28.000.

Binkerd, Evan F.: *See*—
Rendek, Robert B.; and Binkerd, Evan F., 3,700,847.

Bio-Research Consultants, Inc.: *See*—
Van Dongen, Cornelis G., 3,699,925.
Van Dongen, Cornelis G., 3,699,927.

Birdsall, Bert A. Material carrier. 3,700,283, Cl. 298-7.000.

Birkin, Michael Sambrook, to British Railways Board. Communication systems between a trackway and vehicles. 3,700,886, Cl. 246-63.00a.

Bissett-Berman Corporation, The: *See*—
Plehal, Edward J., 3,700,974.

Bjorkroth, Jarl A., to Avesta Jernverks Aktiebolag. Welding electrode. 3,700,851, Cl. 219-137.000.

Bjorn, James M.; and Marx, Frederick, Jr. Mercury loaded brass ball bearing. 3,701,072, Cl. 339-5.001.

Blanchard, Russell T. Collapsible container. 3,700,134, Cl. 217-12.000.

Blankenship, John E.: *See*—
Scheibe, Harold R.; and Blankenship, John E., 3,700,350.

Blasbalg, Herman L.; Hayase, Joshua Y.; Crutchfield, Richard C., Jr.; and Najjar, Hann F., to International Business Machines Corporation. Adaptive digital communication system. 3,700,820, Cl. 179-15.0bv.

Blaurock, Gunter; Hans, Stender; and Werner, Will, to Deutsche Star Kugelhalter GmbH. Spacer ring. 3,700,271, Cl. 287-52.040.

Blaw Knox Construction Equipment, Inc.: *See*—
Davin, Donald R.; and Beckley, Gary H., 3,700,288.

Blaw-Knox Company: *See*—
Eibe, Werner W.; and Farrell, Wilfred T., Jr., 3,699,796.

Blaw-Knox Foundry & Mill Machinery, Inc.: *See*—
Eibe, Werner W., 3,699,791.

Blease, Wilfred J., to Pioneer Plastics, Inc. Plastic fence. 3,700,213, Cl. 256-19.000.

Bliler, Marion D.: *See*—
Brown, Charles W.; Bliler, Marion D.; and Breuel, Jerry F., 3,699,904.

Bloch, Rene A.; Furmansky, Mordechay; and Gassner, Saul, to Hydronautics-Irael Ltd. Ion-activity measuring electrode. 3,700,576, Cl. 204-195.00m.

Bloching, Helmut, to Henkel & Cie G.m.b.H. Color-stable liquid detergent containing disinfectants. 3,700,601, Cl. 252-105.000.

Block, James P., to LCOA Laminating Company of America. Laminated board and method of making same. 3,700,341, Cl. 408-1.000.

Blomqvist, Nils Verner: *See*—
Croon, Ingemar Liss-Albin; and Blomqvist, Nils Verner, 3,700,549.

Bobrick, Mitchell, to Air King Corporation. Architectural light and adjustment means therefor. 3,700,885, Cl. 240-78.00h.

Bode, Charles H., Jr., to United States Steel Corporation. Self-aligning and flexing guide-roll rack. 3,700,073, Cl. 193-35.000.

Bode, James Daniel, to Bendix Corporation, The. Laminar flow fluid filter. 3,700,111, Cl. 210-322.000.

Bodeck, Andrew Henry; and Levinstein, Hyman Joseph, to Bell Telephone Laboratories, Incorporated. Magnetic domain propagation arrangement including medium with graded magnetic properties. 3,701,127, Cl. 340-174.0tf.

Bodine, Albert G., to Hawker Siddeley Dynamics Limited. Apparatus for accomplishing sonic fusion welding and the like involving variable impedance load factors. 3,700,888, Cl. 228-1.000.

Boeck, Gunther A., to Keystone Engineering Company. Self-locking latch mechanism. 3,700,301, Cl. 312-333.000.

Boeing Company, The: *See*—
Charters, Robert L.; Bartlemay, James M.; Folline, John M.; and Donich, Thomas G., 3,701,120.

Boersma, Richard E., to Allis-Chalmers Corporation. Scraper elevator lifting and cushioning mechanism. 3,700,383, Cl. 37-8.000.

Bohannon, William D., Jr., to Western Electric Company, Incorporated. Package. 3,700,100, Cl. 206-65.00f.

Bolduc, Lee R., to Medical Plastics, Inc. Electrical connector and plate electrode. 3,699,968, Cl. 128-303.130.

Bolt, Gregory L.; and Strobel, Rudolf G. K., to Procter and Gamble Company, The. Coffee extration process. 3,700,463, Cl. 99-71.000.

Bondurant, John C. Temperature change actuated motor. 3,699,769, Cl. 60-23.000.

Bonnier, Etienne; Allibert, Colette; Driole, Jean; and Wicker, Alain, to Agence Nationale de Valorisation de la Recherche. Method of preparation of alloys of refractory metals. 3,700,428, Cl. 75-10.00r.

Bonyhard, Peter Istvan; and Nelson, Terence John, to Bell Telephone Laboratories, Incorporated. Dynamic reallocation of information on serial storage arrangements. 3,701,132, Cl. 340-174.0tf.

Boram, William R.; and Acle, Luis, Jr., to International Harvester Company. Polyimides of benzophenone tetracarboxylic acid esters and aromatic diamines having a basicity constant of less than 10-11 and method of preparation. 3,700,649, Cl. 260-65.000.

Borden, Howard C.: *See*—
Barrett, John C.; Borden, Howard C.; and Loebner, Egon E., 3,701,123.

Borrello, Sebastian R.: *See*—
Belasco, Melvin; and Borrello, Sebastian R., 3,700,980.

Borrevik, Alexander J.; and Tennes, Charles J., to Hammond Corporation. Electronic musical instrument master oscillator with provision for frequency control. 3,701,040, Cl. 331-44.000.

Borsuk, Michael Howard; and Ritsopoulos, Sotirios Constantine, to Bell Telephone Laboratories, Incorporated. Frequency interleaved video multiplex system. 3,700,793, Cl. 178-6.800.

Borysko, Emil. Process for applying a thin coating of polytetrafluoroethylene. 3,700,489, Cl. 117-106.00r.

Bosch, Jose. Hydraulic shock absorber for looms. 3,700,033, Cl. 139-161.000.

Bosch, Robert, G.m.b.H.: *See*—
Adler, Karl-Heinz; Locher, Johannes; Lemanczyk, Rudolf; and Schonart, Edgar, 3,699,935.
Adler, Karl-Heinz; Domann, Helmut; and Locher , Johannes, 3,701,041.
Eckert, Konrad; Eheim, Franz; Hofer, Gerald; and Koster, Claus, 3,699,939.

Bosch, Werner; and Kobler, Ulrich, to Siemens Aktiengesellschaft. Electromagnet assembly for relays. 3,701,066, Cl. 335-274.000.

Bosomworth, Douglas Robert, to RCA Corporation. Character generator utilizing a display with photochromic layer. 3,700,791, Cl. 178-68.000.

Bosquain, Maurice; Bourjot, Marcel; and Kirsch, Maurice, to L'Air Liquide, Societe Anonyme pour l'Etude et Exploitation des Procedes Georges Claude. Heat exchanger support structure. 3,700,030, Cl. 165-145.000.

Boucher, Raymond W. Convertible sidewalk bike. 3,700,251, Cl. 280-7.110.

Bourjot, Marcel: *See*—
Bosquain, Maurice; Bourjot, Marcel; and Kirsch, Maurice, 3,700,030.

Bourland, Andre, to Societe Anonyme d'Explosifs Industriels-Celtite. Arrangements for anchoring supporting pins or bolts. 3,699,687, Cl. 61-45.00b.

Bourns, Inc.: *See*—
Baldwin, Kenneth B.; and Sullivan, Ronald D., 3,701,070.

Bowden, James E.; and Glick, William L. Interconnecting carrier bodies for semiconductor devices. 3,701,079, Cl. 339-36.000.

Bowen, Gary W.: *See*—
Berman, Max; and Bowen, Gary W., 3,701,102.

Boyd, Clarence L.: *See*—
Boyd, Loyce M.; and Boyd, Clarence L., 3,700,057.

Boyd, Loyce M.; and Boyd, Clarence L. Foldable transportation device. 3,700,057, Cl. 180-1.00r.

Boyse, Alan: *See*—
Hughes, Ronald William; and Boyse, Alan, 3,699,941.

BP Chemicals Limited: *See*—
Harvey, Lawrence, 3,700,140.

Bracken, Thomas W., to Eastman Kodak Company. Bimodal film cutter adapted to handle different film widths. 3,699,834, Cl. 83-446.000.

Bradford, James C.; Miller, Stephen H.; and Robertson, Jeffrey C., to Eastman Kodak Company. Flex-snubber. 3,700,188, Cl. 242-194.000.

Bradley, Edmund G.; and Whittingham, Reginald P. Internal line-up clamp for pipe lines. 3,699,635, Cl. 29-252.000.

Bradley, Raymond H., to United States of America, National Aeronautics and and Space Administration. Method of delivering a vehicle to earth orbit and returning the reusable portion thereof to earth. 3,700,193, Cl. 244-155.000.

Bradley, Ruth D.: *See*—
Keene, Carl E.; and Bradley, Ruth D., 3,700,510.

Brady, Donnie G.; Zuech, Ernest A.; and Gray, Roy A., to Phillips Petroleum Company. Flame-retarded olefin polymers and additive systems therefor. 3,700,625, Cl. 260-45.75r.

Brady, Donnie G., to Phillips Petroleum Company. Preparation of allylic esters with palladate an platinate catalysts. 3,700,724, Cl. 260-491.000.

Bramble, Ronald L., to Mayer, Frank, & Associates, Inc. Display device. 3,699,699, Cl. 40-125.00h.

Brandes, Raymond G.; and Pleass, Charles M., to Bell Telephone Laboratories, Incorporated. Electrical resistance heater. 3,700,857, Cl. 219-543.000.

Brandt, Wilbur. Fuel reserve device and system. 3,699,995, Cl. 137-256.000.

Branson Instruments, Incorporated: *See*—
Rissolo, Herman A., 3,700,937.

Branton, Eric Sidney, to Activated Sludge Limited. Pipe supporting means. 3,700,197, Cl. 248-71.000.

Brauser, Klaus J.; Kritikos, Athanasios; Kroy, Walter; and Mehnert, Walter E., to Messerschmitt-Bolkow-Blohm GmbH. Magneto-optic storage element. 3,701,131, Cl. 340-174.0yc.

Breitkopf, Stephen H.; and Scaduto, Michael, to American Hospital Supply Corporation. Method of making disposable garments. 3,699,591, Cl. 2-243.00r.

Bressickello, Tony J.: *See*—
Norman, Richard R., 3,699,741.

Bretchneider, Otto: *See*—
Landt, Uwe; Seifert, Helmut; and Bretchneider, Otto, 3,700,430.

Breuel, Jerry F.: *See*—
Brown, Charles W.; Bliler, Marion D.; and Breuel, Jerry F., 3,699,904.

Breuer, Hans; Manner, Erich; and Michl, Karl-Heinz, to Wacker-Chemie G.m.b.H. Molding substances of low- and high-pressure polyethylene. 3,700,759, Cl. 260-897.000.

Brewer, Waldo L; and Laukaitis, Joseph F., to Eastman Kodak Company. Autmatic searching system. 3,700,320, Cl. 353-26.000.

Brewster, Alan R.: *See*—
Mortimer, Frank R.; Brewster, Alan R.; and Bartram, Michael J., 3,700,075.

Brey, Wilhelm; Hostetler, William; Loeffler, Earl Ferdnand; Kolm, Hubert Ernest; and Elder, Fred Grove, to Firestone Tire & Rubber Company, The. Tire building machine having means advancing a plurality of drums through a plurality of assembly stations. 3,70,526, Cl. 156-396.000.

Brickner, Kenneth G. Ferretic stainless steels with improved stretch-forming characteristics. 3,700,432, Cl. 75-126.00c.

Bridges, John: *See*—
Riley, Ray Joe, 3,700,459.

Brinckman, Eric Maria; Van Den Heuvel, Walter August; Vanhalst, Johan Eugeen; and Heugebaert, Frans Clement, to Gevaert-Agfa N.V. Photosensitive printing-out composition containing chemically sensitized ortho-rhombic crystalline Pb(II) oxide. 3,700,452, Cl 96-88.000.

Brindley, Giles Skey; and Donaldson, Peter Eden Kirwan, to National Research Development Corporation. Striate cortex stimulator. 3,699,970, Cl. 128-419.00r.

Brint, Norman Trevor, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in Her Britannic Majesty's Government of the. Cocking mechanisms for guns. 3,700,394, Cl. 89-1.00k.

Brint, Norman Trevor, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in her Britannic Majesty's Government of the. Loading mechanism for guns. 3,700,395, Cl. 089/045000.

Bristol-Myers Company: *See*—
Jensen, Jorgen Bent; Jensen, Borge; Krohn, Rasmus; and Keldmann, Erik, 3,700,853.

Bristow, Robert H., to General Electric Company. Ceramic-to-metal seal. 3,700,420, Cl. 29-195.000.

British Insulated Callender's Cables Limited: *See*—
Lawrenson, Thomas, 3,700,786.

British Railways Board: *See*—
Birkin, Michael Sambrook, 3,700,886.

Broeren, John E.: *See*—
Diring, James A.; Engel, John B.; and Broeren, John E., 3,700,181.

Broghton, Donald B.: *See*—
Berger, Charles V.; and Broghton, Donald B., 3,700,744.

Brokke, Mervin E.; and Williamson, Thomas B., to Stauffer Chemical Company. 2-(3,4,4-trifluoro-3-butenylthio)-4,4, 6-trimethyl-dihydropyrimidine. 3,700,668, Cl. 260-251.00r.

Bronfin, Barry Robert; Burwell, Wayne Gregory; and Meinzer, Richard August, to United Aircraft Corporation. Chemical mixing laser. 3,701,045, Cl. 331-94.500.

Broslaw, Edwin, to Crest-Foam Corporation. Apparatus for locating the geometric center of a workpiece. 3,700,901, Cl. 250-201.000.

Broughton, Donald B., to Universal Oil Products Company. Dual temperature fixed carbon bed heavy water concentration process. 3,700,417, Cl. 23-312.00w.

Brouwer, Charles W.; Bucheister, Henry C.; and Tata, Raymond V., to Leesona Corporation. Bobbin handling apparatus. 3,700,051, Cl. 177-59.000.

Brown & Root, Inc.: *See*—
Smith, Leif H., 3,699,692.

Brown & Williamson Tobacco Corporation: *See*—
Frische, Andrew Ferdinand, 3,699,972.

Brown Boveri-Sulzer Turbomasinen Aktiengesellschaft: *See*—
Frutschi, Hans Ulrich, 3,699,681.

Brown, Charles W.; Bliler, Marion D.; and Breuel, Jerry F. Cremator. 3,699,904, Cl. 110-8.00c.

Brown, David L.: *See*—
Satterfield, Homer E.; Stottlemyer, Keith D.; Brown, David L.; and Roberts, Leslie, 3,700,547.

Brown, Stephen V., to Sylvania Electric Products Inc. Photoflash lamp. 3,700,377, Cl. 431-93.000.

Brown, William R.: *See*—
Brown, William R.; Bang, Veron E.; and Brown, William R., 3,700,838.

Brown, William R.; Bang, Veron E.; and Brown, William R., to Mallory, P. R., & Co., Inc. Timer utilizing spring clutch. 3,700,838, Cl. 200-38.00r.

Bruene, Warren B., to Collins Radio Company. Equalizer circuit for multistage feedback amplifier. 3,701,034, Cl. 330-28.000.

Brundell och Johsson AB: *See*—
Jonsson, Karl-Erik Arnold, 3,700,845.

Brunswick Corporation: *See*—
Reineman, Richard G.; and Schaefer, George E., 3,700,279.
Roberts, John A.; Roberts, Peter R.; and Kelly, James E., 3,699,768.
Walker, Jerome F., 3,700,236.
Webber, Harold H.; and Riordan, Pauline F., 3,699,590.

Brusca, Donald R., to Enzomedic Laboratories, Inc. Nad salts and methods of preparation. 3,700,654, Cl. 260-211.50r.

Brust, David Philip; Minsk, Louis Morton; and Abel, Edward Peter. Polymers of N-[tris(hydroxymethyl)methyl] acrylamide. 3,700,635, Cl. 260-80.30n.

Bryant, Herbert William, to Bell Telephone Laboratories, Incorporated. Electroacoustic transducer with magnetic transducing element clamping. 3,700,938, Cl. 310-9.100.

Buchan, William R., to Itek Corporation. Optical information processing using variable electro-optic spatial filter. 3,700,902, Cl. 250-201.000.

Bucheister, Henry C.: *See*—
Brouwer, Charles W.; Bucheister, Henry C.; and Tata, Raymond V., 3,700,051.

Bucher-Guyer AG Maschinenfabrik: *See*—
Hauser, Hans Ulrich, 3,699,755.

Buchheit, Otto Karl, to Moeller & Neumann GmbH. Universal rolling mill stand hang more than one calibre for rolling profiles beams such as I-beams. 3,699,794, Cl. 72-225.000.

Buchmann, Hans, to Mettler Instrumente A.G. Top loading precision balance having annular weights. 3,700,056, Cl. 177-237.000.

Buczek, Carl J.: *See*—
Skolnick, Michael L.; and Buczek, Carl J., 3,700,309.

Budd Company, The: *See*—
Rosiek, Frank C., 3,699,637.

Bueler, Richard C., to Wagner Electric Corporation. Control valve. 3,700,286, Cl. 303-6.00c.

Buffington, William: *See*—
Heitfield, Vernon D., 3,700,253.

Bugmann, Ernst. Antifriction bearing. 3,700,296, Cl. 308-187.200.

Bullock, Clifford Ralph: *See*—
Robbisn, William Paul; and Bullock, Clifford Ralph, 3,700,019.

Bulova Watch Company, Inc.: *See*—
Dostal, Frank; and Badowski, Charles, 3,700,304.
Van Haaften, Egbert, 3,699,764.

Bunce, Earl G. Rotary internal combustion engine. 3,699,930, Cl. 123-8.410.

Bundy, Patrick L., to Michigan Carton Co. Flat foldable carton having a preformed, anchored in place, and folded bottom, with self-locking top. 3,700,161, Cl. 229-41.00c.

Bunker-Ramo Corporation: *See*—
Belton, John Price, Jr., 3,701,027.

Burdwood, Howard A. Method and apparatus for use in inflating tennis and other balls. 3,699,739, Cl. 53-7.000.

Burgarella, John P.; and Ellin, Seymour, to Polaroid Corporation. Flash synchronization circuit for sequential firing of an array of flashbulbs. 3,699,861, Cl. 95-11.500.

Burgess, Norman: *See*—
Clarke, Maurice George; and Burgess, Norman, 3,700,951.

Burke, Oliver W., Jr. Elastomer-silica pigment masterbatches and production processes relating thereto. 3,700,619, Cl. 260-336.6ao.

Burke, Oliver W., Jr. Elastomer-silica pigment masterbatches and production processes relating thereto. 3,700,620, Cl. 260-33.6ad.

Burke, Oliver W., Jr. Elastomer-silica pigment masterbatches and production processes relating thereto. 3,700,621, Cl. 260-33.6ao.

Burke, Oliver W., Jr. Silica pigment and elastomer-silica pigment masterbatches and production processes relating thereto. 3,700,690, Cl. 260-336.0ao.

Burnham, William L., to Eastman Kodak Company. Automatic rewind device for web handling apparatus. 3,700,186, Cl. 242-189.000.

Burns, Harold S., to Electro Marine Corporation. Binnacle. 3,699,658, Cl. 33-223.000.

Burroughs Corporation: *See*—
Caras, Bernard, 3,700,946.

Burton, Robert Edward. Separation of organic solids from waste liquids. 3,700,590, Cl. 210-17.000.

Burwell, Wayne Gregory: *See*—
Bronfin, Barry Robert; Burwell, Wayne Gregory; and Meinzer, Richard August, 3,701,045.

Busby, Edwin S., Jr., to Compex Corporation. Variable light transmitting filter for cameras. 3,700,314, Cl. 350-314.000.

Buser, Fritz, AG Maschinenfabrik: *See*—
Thierstein, Hans, 3,699,885.

Buteux, Richard Harold Barclay, to Imperial Chemical Industries, Limited. Biaxially oriented polyethylene-1: 2-diphenoxyethane-4:4'-dicarboxylate sheets. 3,700,540, Cl. 161-165.000.

Butherus, Alexander Duane; and Newby, Kenneth Russ, to Bell Telephone Laboratories Incorporated. Double layer capacitor with liquid electrolyte. 3,700,975, Cl. 317-230.000.

Butler, Robert G.; Carter, Don E.; and Latinen, George A.; deceased (by Latinen, May V.; Administratrix), to Monsanto Company. Flush cooling of shaft sealing screw means. 3,700,247, Cl. 277-28.000.

Butter, Stephen A., to Mobil Oil Corporation. Selective carbonylation of olefinically unsaturated hydrocarbons using palladium-phosphine catalysts promoted with tin salts. 3,700,706, Cl. 260-410.90r.

Butzow, Neil W.; and Harris, Bernard, to Rex Chainbelt Inc. Ball and socket bearing. 3,700,295, Cl. 308-72.000.

Bysouth, Peter Thomas; and Wild, Anthony Musgrave, to BDH Pharmaceuticals Limited. 3-(p-substituted phenyl) propane-1, 2-diols. 3,700,738, Cl. 260-613.00r.

Cabbage, John T.: *See—*
Bellinger, Robert M.; and Cabbage, John T., 3,700,566.

Cache Valley Dairy Association: *See—*
Fowler, Dean A., 3,700,373.

Cairncross, Allan; and Sheppard, William Arthur, to Du Pont de Nemours, E. I., and Company. Fluoroorganocopper compounds, complexes and solutions thereof for copper-coating substrates. 3,700,693, Cl. 260-340.600.

Calgari, Seba: *See—*
Siclari, Francesco; Rossi, Pietro Paolo; Calgari, Seba; and Jacuone, Roberto, 3,700,631.

California Institute of Technology: *See—*
Rembaum, Alan, 3,700,603.

Callander, George C.: *See—*
Sheahan, Desmond F.; and Callander, George C., 3,699,916.

Calvert, Rodney K.; and Landrum, Charles Rabun, to Mead Corporation, The. Film heating system. 3,699,666, Cl. 34-54.000.

Cam Rotors Limited: *See—*
Prendergast, Charles Scott, 3,699,848.

Camelot Stone, Inc.: *See—*
Sullivan, Wayne S., 3,700,516.

Cameron, Malcolm R. Therapeutic bath back brush and process of using same. 3,699,602, Cl. 15-21.00d.

Campen, Jan P.; and Kok, Riekert, to Shell Oil Company. Recovery of sulfonium salt extracting agents. 3,700,767, Cl. 423-24.000.

Canada, Her Majesty the Queen in the right of, as represented by the Minister of National Defence: *See—*
Simonds, Peter, 3,701,159.

Canadian Patents and Development Limited: *See—*
Kusters, Norbert L.; and Moore, William J. M., 3,701,008.
Moschopedis, Speros E.; Czakert, Ernst; and Creighton, Stephen M., 3,700,728.

Candor, James T.: *See—*
Candor, Robert R.; and Candor, James T., 3,699,663.

Candor, Robert R.; and Candor, James T. Method and apparatus for treating sheet-like material with fluid. 3,699,663, Cl. 34-9.000.

Cannara, Alexander B., to Ballantine Laboratories, Inc., mesne. Integrating converters with synchronous starting. 3,701,142, Cl. 340-347.0nt.

Canon Kabushiki Kaisha: *See—*
Ogiso, Mitsutoshi; and Ohtaki, Shohei, 3,699,858.

Canon Kabushiki Kaisha, mesne: *See—*
Knecktel, Wilhelm Josef; and Schaffer, Detlef, 3,699,992.

Cantagallo, Raymond E.; and Lutz, Robert J., to Sun Shipbuilding & Dry Dock Company. Apparatus for transportation of commodites. 3,699,870, Cl. 98-10.000.

Cantarutti, Armindo: *See—*
Matsuoka, James T.; and Cantarutti, Armindo, 3,700,374.

Caplan, Sandor; and Lamorte, Michael F., to RCA Corporation. Semiconductor laser devices utilizing light reflective metallic layers. 3,701,047, Cl. 331-94.500.

Caras, Bernard, to Burroughs Corporation. Gaseous display panel with apertured, metallic strip-like, scanning cathodes. 3,700,946, Cl. 313-188.000.

Carey Press Corporation: *See—*
Friedman, Arthur S., 3,700,264.

Carlsmith, Lawrence Allan: *See—*
Rich, John Parker; and Carlsmith, Lawrence Allan, 3,700,548.

Carlson, Eric A. Material handling device. 3,699,900, Cl. 108-53.000.

Carlson, Eugene E.: *See—*
Schuning, Kenneth W.; and Carlson, Eugene E., 3,699,773.

Carman, Alexander J., to Stevens, J. P., & Co., Inc. Apparatus for feeding filling threads to a warp knitting machine. 3,699,783, Cl. 66-84.000.

Carpenter, David W.; and Rodgers, Charley R., to United States of America, Navy. Propellant grain. 3,700,762, Cl. 264-3.000.

Carpenter, Douglas D. Lotion applicator. 3,699,980, Cl. 132-88.700.

Carpenter, Tim D.: *See—*
Bichsel, Stanley E.; and Carpenter, Tim D., 3,700,460.

Carpini, Thomas D.: *See—*
Maiden, Donald L.; Monteith, James H.; and Carpini, Thomas D., 3,699,811.

Carr, Russell L. K.; and Baranauckas, Charles F., to Hooker Chemical Corporation. Fluorinated tetrahydro-pyrans. 3,700,695, Cl. 260-345.800.

Carrier Corporation: *See—*
Anderson, Carl M.; and Endress, James W., 3,700,355.
Gutheim, August W., 3,700,198.

Carrier Craft Corporation: *See—*
Garvey, Francis J.; and Winterbottom, Bruce, 3,699,729.

Carroll, James C.: *See—*
Garcia, Julian; and Carroll, James C., 3,700,817.

Carson, Don B.: *See—*
Uitti, Kenneth D.; and Carson, Don B., 3,700,216.

Carter, Don E.: *See—*
Butler, Robert G.; Carter, Don E.; and Latinen, George A., 3,700,247.

Carter, J. Warne, to Ciba-Geigy Corporation. Methods of forming a fiber reinforced pipe on an inflatable mandrel. 3,700,519, Cl. 156-156.000.

Cartmell, James V.; Churchill, Donald; and Koopman, Donald E., to National Cash Register Company, The. Electro-optic shutter having a thin glass or silicon oxide layer between the electrodes and the liquid crystal. 3,700,306, Cl. 350-150.000.

Case, Forrest Neil: *See—*
Acree, Elick H.; Case, Forrest Neil; and Stephens, Nancy H., 3,700,602.

Case,Laura K.: *See—*
McLeod, Gerald L.; French, Hollis E.; Case,Laura K.; Berman, Elliot; and Casella, Joseph, 3,700,440.

Casella, Joseph: *See—*
McLeod, Gerald L.; French, Hollis E.; Case,Laura K.; Berman, Elliot; and Casella, Joseph, 3,700,440.

Castro, Rodolfo: *See—*
Tarbox, John W.; Hinds, Walter E.; and Castro, Rodolfo, 3,699,630.

Caterpillar Tractor Company: *See—*
Spencer, Blaine G.; and Clinebell, Lyle R., 3,699,625.

Catt, Kevin: *See—*
Tregear, Geoffrey W.; Battaerd, Hendrik A. J.; Lang, Gunter A.; Catt, Kevin; and Niall, Hugh D., 3,700,609.

C.A.V. Limited: *See—*
Peltret, Pierre Henri, 3,699,816.

Centre Electronique Horloger SA: *See—*
Vittoz, Eric Andre, 3,700,916.

Chabot, Leo L., to North American Rockwell Corporation. Open End electrostatic spinning head. 3,699,760, Cl. 57-58.890.

Chabot, Ronald W.; Leonard, George S.; and Sheena, David, to Whittaker Corporation. Movement monitoring apparatus. 3,699,856, Cl. 95-1.100.

Chace, Donald E.; Melvin, James A., Jr.; Ricketts, Alan W., Jr.; Steinberger, Edward P.; and Symmes, David T., to Digital Equipment Corporation. Analyzer for sequencer controller. 3,701,113, Cl. 340-172.500.

Chandhok, Vijay Kumar, to Crucible, Inc. Method for making powder metallurgy shapes. 3,700,435, Cl. 75-214.000.

Chang, Hsu; and Genovese, Eugene R., to International Business Machines Corporation. Self-contained magnetic bubble domain memory chip. 3,701,125, Cl. 340-174.0tf.

Chapin, James R.: *See—*
Noble, Philip S.; and Chapin, James R., 3,700,128.

Chapuis, Robert, to Etablissements Ruby S.A. Sanitary napkin. 3,699,966, Cl. 128-290.00r.

Charlson, Robert J.; and Ahlquist, Norman C., to Battelle Development Corporation, The, mesne. Method and apparatus for making an in-situ determination of the chemical properties of atmospheric aerosols. 3,700,333, Cl. 356-103.000.

Charters, Robert L.; Bartlemay, James M.; Folline, John M.; and Donich, Thomas G., to Boeing Company, The. Analog capacitor memory with slow write-in and fast nondestructive read-out. 3,701,120, Cl. 340-173.00r.

Chase-Shawmut Company , The: *See—*
Belcher, Richard A., 3,701,069.

Chelminski, Stephen V., 12% to Parmelee, Kendall G. Rotary wing aircraft lift and propulsion method and systems. 3,699,771, Cl. 60-39.350.

Chemcut Corporation: *See—*
Coffman, Frederick E., 3,699,919.

Chemed Corporation: *See—*
Coffey, Charles R.; and Tesdahl, Thomas C., 3,700,013.

Chemical Construction Corporation: *See—*
Tourtellotte, John F.; Negra, John S.; Warshaw, Abe; and Villiers-Fisher, John F., 3,699,683.

Chen, Nai Yuen; Lucki, Stanley J.; and Garwood, William E., to Mobil Oil Corporation. Dewaxing of oils by shape selective cracking an hydrocracking over zeolites ZSM-5 and ZSM-8. 3,700,585, Cl. 208-111.000.

Cheney, Raymond E., to International Business Machines Corporation. Method and apparatus for fracturing metal. 3,700,150, Cl. 225-1.000.

Chevron Research Company: *See—*
Hutchison, Stanley O., 3,700,034.
Kray, Louis R., 3,700,725.
Singer, Malcolm S., 3,700,699.

Chhabra, Indarmohan S.: *See—*
Giardini, Dante S.; and Chhabra, Indarmohan S., 3,699,728.

Chikuma, Toichi, to Girling Limited. High frequency amplification system. 3,701,035, Cl. 330-31.000.

Chin, James; Witt, Harry S.; and Schwartz, Eli, to Uniroyal, Inc. Electrolessly platable polymeric blends. 3,700,481, Cl. 117-47.00a.

Christie, Colin McMaster, to Aqua-Marine Mfg., Limited. Liquid supply system with motor operated pump actuated by switch controlled by on-off valve in system. 3,700,002, Cl. 137-565.000.

Chulak, William, to Northern Electric Company, Limited. Combined alarm transmission and service call system. 3,700,823, Cl. 179-18.00b.

Churchill, Donald: *See—*
Cartmell, James V.; Churchill, Donald; and Koopman, Donald E., 3,700,306.

Ciba-Geigy AG: *See—*
Aktermatt, Hans, 3,700,700.
Gassmann, Hans Ulrich; and Mugnier, Michel, 3,699,804.
Inman, Eric Richard; Macpherson, Ian Alexander; and Stirling, John Andrew, 3,700,709.

Nachbur, Hermann; and Maeder, Arthur, 3,700,403.
Ciba-Geigy Corporation: *See—*
Carter, J. Warne, 3,700,519.
Petite, Anthony M.; and Thornley, Clive E., 3,700,405.
Cier, Harry E., to Esso Research and Engineering Company. Manufacture of aromatic formaldehyde resins. 3,700,640, Cl. 260-67.00a.
Cincinnati, Melacron Inc.: *See—*
Fischer, Thomas R., 3,700,993.
Cincinnati Milacron Inc.: *See—*
Lenning, Ronald L., 3,699,720.
Owens, William A., 3,700,292.
Cinquegrani, Vincent J. Fuel control system using RF circuits. 3,699,931, Cl. 123-32.0ea.
Cioccio, Armand; and Goo, Gee-In, to United States of America, Navy. Coil configuration for an electromagnetic warhead influence firing system. 3,699,889, Cl. 102-18.000.
Cities Service Company: *See—*
Meldrum, David R., 3,700,475.
Meldrum, David R., 3,700,476.
Scott, Charles E., 3,700,615.
Cities Service Oil Company: *See—*
Scott, J. O., 3,699,685.
Clark, Albert A.: *See—*
Cushman, Paul G.; and Clark, Albert A., 3,700,986.
Clark Equipment Company: *See—*
Myers, James E., 3,700,114.
Clark, Jeri O.: *See—*
Pearson, Lee E.; and Clark, Jeri O., 3,700,512.
Clark, Otto A.: *See—*
Murgas, Karl M.; Greenberg, Burton; and Clark, Otto A., 3,700,326.
Clarke, Charles D.; and Hartling, Donald C., to Mattel, Inc. Simulated sewing machine toy. 3,699,705, Cl. 46-39.000.
Clarke, Kenneth; and Bevan, Ronald, to Imperial Chemical Industries Limited. Rollers. 3,699,621, Cl. 29-113.00r.
Clarke, Maurice George; and Burgess, Norman, to Thorn Lighting Limited. Discharge lamps having improved thermionic cathodes. 3,700,951, Cl. 313-346.000.
Clary Corporation: *See—*
Frydenberg, Donald V., 3,699,622.
Clausse, Georges Jean Louis-Marie, to Hoover Company, The. Temperature responsive electric control device. 3,701,063, Cl. 335-146.000.
Claydon, Gyongyver: *See—*
Ryley, Derek Vernon; and Claydon, Gyongyver, 3,700,789.
Ryley, Derek Vernon; and Claydon, Gyongyver, 3,700,790.
Clegg, Robert J., to United States of America, Navy. Method for optically detecting lightning radiation. 3,700,336, Cl. 356-226.000.
Clemence, Francois; and Le Martret, Odile, to Roussel-UCLAF. Certain thiazole-5-carboxylates. 3,700,677, Cl. 260-294.80d.
Clemmensen, Ellen: *See—*
Anneberg, Vilhelm; Clemmensen, Ellen; Gudmandsen, Robert; and Scheibel, Axel, 3,700,829.
Clifton, John Stephen; and Parker, Dawood, to National Research Development Corporation. Apparatus for measuring the concentration of dissolved oxygen in an aqueous solution. 3,700,578, Cl. 204-195.00p.
Clifton, John Stephen; and Parker, Dawood, to National Research Development Corporation. Apparatus for measuring the concentration of dissolved oxygen in an aqueous solution. 3,700,579, Cl. 204-195.00p.
Clinebell, Lyle R.: *See—*
Spencer, Blaine G.; and Clinebell, Lyle R., 3,699,625.
Cluett, Ronald D., to GTE Laboratories Incorporated. Arc discharge lamp control circuit. 3,700,956, Cl. 315-101.000.
Coal Industry (Patents) Limited: *See—*
Agnew, James Malcolm, 3,700,284.
Coars Porcelain Company: *See—*
Spurck, Richard F., 3,700,788.
Coats Company, Inc., The: *See—*
Motis, Gilbert M., 3,700,021.
Cocca, Frank J., to Sylvania Electric Products, Inc. Method of dividing wafers. 3,699,644, Cl. 29-527.200.
Cocca, Theodore F., to Spacetac Incorporated. Co-firing process for making a resistor. 3,699,650, Cl. 29-620.000.
Cocke, John; Mommens, Jacques H.; and Raviv, Josef, to International Business Machine Corporation. Method of and apparatus for decoding variable-length codes having length-indicating prefixes. 3,701,111, Cl. 340-172.500.
Coffey, Charles R.; and Tesdahl, Thomas C., to Chemed Corporation. Protective coating compositions. 3,700,013, Cl. 106-2.000.
Coffey, Francis T., Sr. Tracked vehicle toy. 3,699,711, Cl. 46-216.000.
Coffinberry, George A.: *See—*
Davis, Donald Y.; and Coffinberry, George A., 3,699,774.
Coffman, Frederick E., to Chemcut Corporation. Apparatus for leveling solder in holes of printed circuit boards. 3,699,919, Cl. 118-56.000.
Cogar Corporation: *See—*
Deverse, Frank T.; Kurtz, John A.; Rendon, Daniel; Trahn, Kenneth A.; and Tuttle, James W., 3,699,917.
Cole, John Elton, Jr., to Du Pont de Nemours, E. I., and Company. Process for dyeing acid-modified nylon fibers. 3,700,398, Cl. 8-21.00b.
Colgate-Palmolive Company: *See—*
Suh, John T.; and Bare, Thomas M., 3,700,692.
Sundby, Bjorn; Kenney, Edward J.; and Wixon, Harold E., 3,700,607.
Collier, Frank J., to Illinois Tool Works, Inc. Hole plug. 3,700,135, Cl. 220-25.000.
Collins Radio Company: *See—*
Bruene, Warren B., 3,701,034.
Sitz, Tilbert C., 3,700,180.
Colman, Robert, to General Alarm Corporation. Telephoning system. 3,700,813, Cl. 179-5.00p.
Colson, William B.: *See—*
Goodrich, George W.; Colson, William B.; and Matle, Calvin C., 3,700,947.
Columbia Research Corporation: *See—*
Murray, Russell; and Gignoux, Dominique, 3,700,909.
Combustion Engineering, Inc.: *See—*
Ketchum, Elmer, Jr., 3,700,173.
Combustion Equipment Associates, Inc.: *See—*
Davis, Robert, 3,700,411.
Commonwealth Scientific and Industrial Research Organization: *See—*
Tauber, Elisha, 3,700,472.
Compagnie des Freins et Signaux Westinghouse: *See—*
Marcillaud, Roger, 3,700,006.
Compagnie Francaise de Raffinage: *See—*
Weisang, Joseph Edouard; and Engelhard, Philippe, 3,700,588.
Compagnie Francaise Thomson Houston-Hotchkiss Brandt: *See—*
Bidault, Michel; Dosdat, Jean; Lelay, Roland; and Parouty, Jran Claude, 3,699,647.
Compex Corporation: *See—*
Busby, Edwin S., Jr., 3,700,314.
Compteurs-Schlumberger Montroage: *See—*
Gaulier, Jean-Claude, 3,700,055.
Computer Image Corporation: *See—*
Harrison, Lee, III; Honey, Francis J.; and Tajchman, Edwin J., 3,700,792.
Computer Test Corporation: *See—*
Lee, Don N.; and McMennamin, Roy B., 3,700,998.
Computest Corporation: *See—*
Lowery, Ronald M.; and Summers, Daniel J., Jr., 3,700,808.
Comstock & Westcott, Inc.: *See—*
Deer, John A, Jr., 3,700,332.
Conant, Barton C.; and Thomas, James A., said Conant assor. to Abbott Coin Counter Co., Inc. Coin value determining apparatus and system. 3,699,981, Cl. 133-8.000.
Concast AG: *See—*
Knell, Bernhard, 3,700,024.
Concrete Formwork Engineers Pty., Ltd.: *See—*
King, John Calaby, 3,700,070.
Condes Corporation: *See—*
Kidd, Arthur H., 3,699,633.
Kidd, Arthur H., 3,700,528.
Condux-Werk Herbert A. Merges KG: *See—*
Wittke, Paul, 3,700,106.
Congoleum Industries, Inc.: *See—*
Placente, Anthony N., 3,700,366.
Consolidated Machines, Inc.: *See—*
Vincent, Daniel B.; Vincent, Daniel A.; and Roberts, George C., 3,700,017.
Consolidated Papers, Limited: *See—*
Bentvelzen, Joseph Maria; and Millington, Alan Dennis, 3,700,536.
Consolidation Coal Company: *See—*
Johnson, James L.; Schora, Frank C., Jr.; and Tarm, Paul B., 3,700,421.
Johnson, James L.; Schora, Frank C., Jr.; and Tarman, Paul B., 3,700,422.
Continental Can Company, Inc.: *See—*
Bagguley, Richard B., 3,700,133.
Bautz, Fred H., 3,700,250.
Ruekberg, Herbert S., 3,700,136.
Control Data Corporation: *See—*
Price, Robert H., 3,701,135.
Control Design, Inc.: *See—*
Hulsman, William H., 3,701,137.
Controls Company of America: *See—*
Orth, Charles D., 3,699,778.
Conwed Corporation: *See—*
Gaffney, Bernard J., 3,700,521.
Cook, James M., III, to Oakland Plastics Corporation. Pallet. 3,699,901, Cl. 108-58.000.
Cook, Michael W., to Goodyear Tire & Rubber Company, The. Push-on bridge washer for pneumatic tire tubes. 3,699,840, Cl. 85-36.000.
Cook, Richard L., to Goodyear Aircraft Corporation. Hard faced plastic armor plate. 3,700,534, Cl. 161-38.000.
Cook, Thomas L., to Giesecke, Albert S. Map folding machine. 3,700,230, Cl. 270-61.00r.
Cookson Metal Developments, Limited: *See—*
Cookson, William, 3,699,737.
Cookson, William, to Cookson Metal Developments, Limited. Roofing and siding sheets and fastening means therefor. 3,699,737, Cl. 52-489.000.
Cooley, Austin C., to Eastman Kodak Company. Regeneration of bleach-fix solutions used in photographic processing. 3,700,450, Cl. 96-60.0bf.

Coon, Clifford L.; Hill, Marion E.; and Ross, Donald L., to United States of America, Navy. 2,2-Bis (difluoramino)-5-fluoro-5,5 dinitro-1pentyl acrylate. 3,700,723, Cl. 260-486.00h.

Coontz, John G. Tractor-mounted post hole digger. 3,700,045, Cl. 173-26.000.

Copeland, James L.: *See*—
Mizuno, William G.; Copeland, James L.; and Scholze, Arlene E., 3,700,599.

Copeland, John Alexander, III., to Bell Telephone Laboratories, Incorporated. Detector for magnetic domain arrangement. 3,701,128, Cl. 340-174.0tf.

Copeland, John Alexander, III., to Bell Telephone Laboratories, Incorporated. Self-biasing single wall domain arrangement. 3,701,129, Cl. 340-174.0tf.

Copystatics Manufacturing Corporation: *See*—
Aasen, Torulf F.; Mogil, Bernard; and Sepulveda, William, Jr., 3,700,231.

Corley, Gale C.Valparaiso, Ind. Portable crane. 3,700,117, Cl. 214-1.00h.

Corley, Quentin D., Jr. Power lift and gate apparatus for truck. 3,700,123, Cl. 214-77.00p.

Cornell, John H., to Monsanto Research Corporation. Herbicidal carbamate compounds. 3,700,426, Cl. 71-106.000.

Corning Glass Works: *See*—
Asher, John W.; and Herczog, Andrew, 3,699,620.
Duke, David A., 3,700,471.

Cornish, Alan H.; Helke, Robert C.; Le Donne, Alex N.; and Masters, Hugh E., to Koehler-Dayton, Inc. Microwave sewage system with distillation means. 3,700,565, Cl. 203-1.000.

Corrado, Ronald F. Cover means for navigational instruments and radio equipment mounted on panel of aircraft. 3,699,787, Cl. 70-58.000.

Corrigan, Charles E.: *See*—
Corsmeier, Robert J.; Howell, Thomas G.; Corrigan, Charles E.; and Koff, Bernard L., 3,700,348.

Corsmeier, Robert J.; Howell, Thomas G.; Corrigan, Charles E.; and Koff, Bernard L., to General Electric Company. Turbomachinery blade structure. 3,700,348, Cl. 416-90.000.

Cory Corporation: *See*—
Karlen, Harvey R., 3,699,944.

Costain Concrete Company, Limited: *See*—
Jennings, Brian Michael; and Ager, Johnwalter Albert, 3,700,167.

Coulter Electronics, Inc.: *See*—
Hogg, Walter R., 3,700,867.
Hogg, Walter R., 3,701,029.
Pontigny, Jacques A., 3,700,991.
Pontigny, Jacques A., 3,700,992.

Counsell, Lulu B. Patient positioning apparatus for use in taking medical X-rays. 3,700,894, Cl. 250-50.000.

Cousins, Morison S.; Klawson, Rennold L.; and Watson, Roy, to General Foods Corporation. Cup with pour spout and circular finish. 3,700,146, Cl. 222-465.000.

Cowan, Frank O. Cattle spraying device. 3,699,928, Cl. 119-159.000.

Cowan, John G., to United States of America, Navy. Display for multi channel sonars. 3,701,089, Cl. 340-3.00r.

Cowans, Kenneth W., to Sub-Marine Systems Incorporated. Gas and liquid processing system. 3,699,775, Cl. 62-55.000.

Cox, Raymond W.: *See*—
Watkins, Phillip L.; and Cox, Raymond W., 3,700,931.

Craft, Jack, to RCA Corporation. Peak-to-peak detector. 3,701,022, Cl. 325-318.000.

Craig, Robert D.; Evans, Richard O.; and Grant, Gerald F., to Anning-Johnson Company. Partitioning system having removable panels. 3,699,734, Cl. 52-127.000.

Craig, William A. Orthopedic appliance. 3,699,954, Cl. 128-80.00a.

Cram, Milton E.: *See*—
Volkel, George D.; and Cram, Milton E., 3,701,006.

Crandon, Harry D.; and Le Boeuf, Albert R., to American Optical Corporation. Polycarbonate substrate with durable, abrasion and scratch-resistant, antifogging coating. 3,700,487, Cl. 117-72.000.

Cranston, Benjamin H.; and Eleftherion, Michael P., to Western Electric Company, Incorporated. Compliant bonding. 3,699,640, Cl. 29-471.100.

Creighton, Stephen M.: *See*—
Moschopedis, Speros E.; Czakert, Ernst; and Creighton, Stephen M., 3,700,728.

Crest-Foam Corporation: *See*—
Broslaw, Edwin, 3,700,901.

Creuz, Walter R., to Aero-Flow Dynamics, Inc. (The Wing Company Division). Apparatus for detecting interruption in the cyclic movement of a member. 3,701,139, Cl. 340-271.000.

Criss, William H.; and Shackelford, John R., to Stange Co. Apparatus for applying liquid surface treating materials to sausages. 3,699,877, Cl. 99-260.000.

Cristiani, Athos, to AMF Incorporated. Glue dispenser for cigarette making machine. 3,700,141, Cl. 222-1.000.

Croon, Ingemar Liss-Albin; and Blomqvist, Nils Verner, to Mo och Domsjo Aktiebolag. Process for manufacturing cross-linked paper and viscose pulp and products produced according to the process. 3,700,549, Cl. 162-157.00c.

Croson, Eddie B., to United States of America, Navy. Photoresist processng method for fabricating etched microcircuits. 3,700,445, Cl. 96-36.200.

Cross Europa-Werk GmbH: *See*—
Schubert, Paul, 3,700,345.

Cross, Henry Daniel III: *See*—
Spangler, William Gilbert; and Cross, Henry Daniel III, 3,700,401.

Crucible, Inc.: *See*—
Chandhok, Vijay Kumar, 3,700,435.

Crutchfield, Richard C., Jr.: *See*—
Blasbalg, Herman L.; Hayase, Joshua Y.; Crutchfield, Richard C., Jr.; and Najjar, Hann F., 3,700,820.

CSF-Compagnie Generale de Telegraphie Sans Fil: *See*—
Vasseur, Jean-Pierre, 3,700,806.

Cunningham, Omar Leo, Jr., to Stromberg Datagraphix, Inc. Film gate. 3,700,318, Cl. 352-225.000.

Cupler, John A., II. Tool infeeding mechanism. 3,700,342, Cl. 408-17.000.

Cushman, Paul G.; and Clark, Albert A., to General Electric Company. Co-ordinated voltage control for induction servomotors. 3,700,986, Cl. 318-227.000.

Cushman, Robert Holbrook, to Western Electric Company, Incorporated. Wire joning tool. 3,700,009, Cl. 140-111.000.

Custom Machine, Inc.: *See*—
Wloszek, Joseph T., 3,699,723.

Cuthertson, William Wilson, to Imperial Chemical Industries, Limited. Silicone-polyalkyline oxide block copolymer suppressing foam in jet dyeing. 3,700,400, Cl. 8-83.000.

Cutting, Jack R.: *See*—
Parkinson, Gerald W.; and Cutting, Jack R., 3,700,995.

Cwskoslovenska akademie ved: *See*—
Dohnalova-Binkova, Blanka; and Binek, Bedrich, 3,700,170.

Cypro-Incorporated: *See*—
Pearson, William S., 3,700,177.

Czakert, Ernst: *See*—
Moschopedis, Speros E.; Czakert, Ernst; and Creighton, Stephen M., 3,700,728.

Czubak, Albin S.: *See*—
Ellis, Nyron P.; Czubak, Albin S.; and McDonald, Keith A., 3,699,724.

Dahlinger, Rodney J.; and Farnsworth, Robert P., to Hughes Aircraft Company. Trigger transformer for pulse forming network. 3,700,913, Cl. 307-107.000.

Dai Nippon Toryo Company, Ltd.: *See*—
Adachi, Toshio; Funakiskp, Sayoko; Furuya, Akio; and Uchida, Masakatsu, 3,700,624.

Daido Seiko Kabushiki Kaisha: *See*—
Adachi, Toshio; Hayashi, Kiyohide; and Okura, Yukio, 3,700,026.

Daimler-Benz Aktiengesellschaft: *See*—
Hortnagl, Franz, 3,700,061.

Dainippon Pharmaceutical Co., Ltd.: *See*—
Kaneko, Hidehiko; Aritomi, Jiro; and Nakamura, Keiji, 3,700,680.

D'Alelio, Gaetano F., to Monacelli, Walter J. Chelating compositions. 3,700,671, Cl. 260-248.000.

Dalley, James Edwin, to Bell Telephone Laboratories, Incorporated. Electronic bilateral beta element switch. 3,700,926, Cl. 307-257.000.

Dalley, James Edwin; and Tsao-Wu, Nelson Tsin, to Bell Telephone Laboratories, Incorporated. Electronic reversing switch. 3,700,927, Cl. 307-257.000.

D'Amato, Paul R. Shelf bracket tool. 3,699,634, Cl. 29-267.000.

D'Amato, Sirio S.: *See*—
Biagi, Alvaro D.; and D'Amato, Sirio S., 3,701,011.

Dame, John S., to Motorola Inc. RF transmission and detection system. 3,701,150, Cl. 343-6.5ss.

Damico, Ralph A., to Procter & Gamble Company, The. Process for preparing salte of pyridinethial n-oxides and 2,2'-dithiopyridine n,n-dioxides. 3,700,676, Cl. 260-294.80g.

Dandl, John E. Modular constructed rotary mower. 3,699,752, Cl. 56-13.600.

Danfoss A/S: *See*—
Jensen, Arne, 3,700,989.

Dangles, Elsie R. M.: *See*—
Dangles, Thomas C.; and Dangles, Elsie R. M., 3,700,095.

Dangles, Thomas C.; and Dangles, Elsie R. M. Pill or capsule dispenser: sure daily reminder. 3,700,095, Cl. 206-42.000.

Daniels, David A., to Grace, W. R., & Company. Flame retardant polyester plasticizer containig 2,2- dibromomethylene-1,3-propanediol. 3,700,957, Cl. 260-31.600.

Dannatt, Hugh St.: *See*—
Ahrns, Wilbur C.; Sweeney, David-F.; and Dannatt, Hugh St., 3,700,087.

Dart Industries, Inc.: *See*—
Berry, David A.; and Gynn, Gilbert M., 3,700,613.
Schenkerberg, William F., 3,700,614.
Swett, James B.; and Ashton, Harold P., 3,700,204.

Davidge, Ronald V.; Locklar, Henry C.; Ralston, James C.; and Ritchie, Robert T., to International Business Machines Corporation. Magnetic brush cleaning system. 3,700,328, Cl. 355-15.000.

Davidson, Jimmy L.; and Rouse, George V., to Radiation Incorporated. Precision polishing of semiconductor crystal wafers. 3,699,722, Cl. 51-283.000.

Davidson, John R., to Motorola, Inc. Tone and volume control for a multi-channel audio amplifier system. 3,700,811, Cl. 179-1.00d.

Davin, Donald R.; and Beckley, Gary H., to Blaw Knox Construction Equipment, Inc. Paving machine. 3,700,288, Cl. 305-38.000.

Davis, Charles T. Cleaning and sterilizing device. 3,699,984, Cl. 134-95.000.

Davis, Donald A.; and Galluzzo, Anthony, to Schwamb Corporation, The. Modular cabinet construction. 3,700,300, Cl. 312-240.000.

Davis, Donald Y.; and Coffinberry, George A., to General Electric Company. Fluid supply system. 3,699,774, Cl. 60-39.280.

Davis, Harry P., to PPG Industries, Inc. Safety windshield and method of making same. 3,700,542, Cl. 161-125.000.

Davis, Harry P., to PPG Industries, Inc. Safety windshield and method of making same. 3,700,543, Cl. 161-165.000.

Davis, Robert, to Combustion Equipment Associates, Inc. Gas analyzer. 3,700,411, Cl. 23-254.00e.

Davis, Roger C., to General Motors Corporation. Electro-optical vehicle exhaust particulate monitor. 3,700,330, Cl. 356-38.000.

Day, Leon E., 50% to Routon, Richard and 50% to Sellers, James B. Hitch. 3,700,263, Cl. 280-415.00a.

DCA Food Industries, Inc.: *See*—
Schiffmann, Robert F.; Stein, Ernest W.; and Kaufman, Harold B., Jr., 3,699,899.

De Gain, William J., to Koppy Corporation, mesne. Stretch method for making a tubular product. 3,699,624, Cl. 29-155.00c.

De Haan, Hermanes Johannus Maria, to U.S. Philips Corporation. Memory store with reduncancy. 3,701,116, Cl. 340-173.00r.

de Learie, Frederic C., to United States of America, Air Force. Drum-display synchronizer. 3,700,800, Cl. 178-6.6dd.

De Luca, Paul V., to Porta Systems Corporation. Cutover transition switching apparatus and method for telephone office equipment. 3,700,824, Cl. 179-98.000.

De Petris, Peter S. Solid state controlled automatic choke. 3,699,937, Cl. 123-119.00f.

De Rubinat, Jean-Marie, to Ateliers de Constructions Electriques de Charleroi (ACEC). Process and apparatus for transmission of binary messages by synchronized frequency shift keying. 3,701,053, Cl. 332-9.00t.

De Sota, Inc.: *See*—
Eaves, Randall H., 3,700,022.

De Varda, Giuseppe, 70% to Montecatini Edison S.p.A. Cryolitic vat for the production of aluminum by electrolysis. 3,700,581, Cl. 204-243.00r.

De Vito, Peter A., to United States of America, Air Force. Phase coded RF pulse generator. 3,701,020, Cl. 325-121.000.

De Winter, Jan Gerrit, to Nicolon N.V. Bottom and bank facing mattress. 3,699,686, Cl. 61-38.000.

Deasy, Raymond E., to Illinois Tool Works Inc. Container package. 3,700,275, Cl. 294-87.200.

Dediemar, Ronald B.; and Schuman, Leroy J., to Barber-Greene Company. Hydraulic adjustment means for roll crushing apparatus. 3,700,182, Cl. 241-230.000.

Deeke, Heinrich E., to National Tool & Die Corporation. Coupling assembly. 3,700,381, Cl. 4-288.000.

Deer, John A, Jr., to Comstock & Westcott, Inc. Spectral analysis using a modulating mask transmitting selected spectral lines and reference bands. 3,700,332, Cl. 356-97.000.

Deere & Company: *See*—
Essex, Duane Arnold, 3,700,038.
Essex, Duane Arnold; Haverdink, Virgil Dean; and Hill, Donald Allan, 3,700,039.
Hentrich, Robert Dale; Esbeck, Howard Christian; and Arnold, Loren Glenn, 3,700,037.
Patterson, Roger Lee; and Ventresca, Mario, 3,700,042.
Peak, Charles Benjamin, 3,699,753.
Ross, Brian Francis; and Spicer, Dalton Harold, 3,699,751.
Sullivan, James Franklin, 3,700,043.

Deering, Charles S., to E-System, Inc. Pulse modulation motor control. 3,700,987, Cl. 318-227.000.

Degel, Josef: *See*—
Karweil, Joachim; and Degel, Josef, 3,700,563.

Delair, Jean-Paul; Raisnn, Jean-Pierre; and Voisin, Eugene. Yarn feeder for a knitting machine. 3,700,153, Cl. 226-114.000.

Delorean, John Z., to General Motors Corporation. Transmission with fluid pressure released brake. 3,700,080, Cl. 192-4.00a.

Denigan, Thomas R.; and Thomas, James L., to North American Rockwell Corporation. Capture combination system. 3,699,839, Cl. 84-345.000.

Denki Kagaku Koyo Kabushiki Kaisha: *See*—
Fukuoka, Ichiro; Takahashi, Satoshi; and Yagi, Norio, 3,700,645.

Denki Onkyo Co., Ltd.: *See*—
Toba, Takao, 3,701,002.
Tsubakihara, Shuzo, 3,701,067.

Denki Onkyo Company, Limited: *See*—
Sakurai, Yasunobu, 3,700,959.
Shimizu, Massao, 3,700,936.

Depree, David O., to Aerojet-General Corporation. Process for the removal and recovery of mineral pollutants from water. 3,700,592, Cl. 210-33.000.

Deremo, Edwin J.: *See*—
Sorensen, Clarence A.; and Deremo, Edwin J., 3,700,363.

Dereng, Viggo G.: *See*—
Pleasants, James E.; and Dereng, Viggo G., 3,700,192.

Dermody, William J.; and Varker, Alan E., to ESB Inc. Body implantable encapsulant and method of preparation. 3,700,628, Cl. 260-47.0en.

Desmond, Donald James. Educational game apparatus. 3,699,671, Cl. 35-48.00r.

Desmoulins, Robert. Drilling installation for extracting products from underwater sea beds. 3,700,048, Cl. 175-6.000.

Deutsche Babcock & Wilcox Aktiengesellschaft: *See*—
Niepenberg, Horst; Oppenberg, Rolf; and Kuhn, Rudolf, 3,700,376.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Asinger, Friedrich; Offermanns, Heribert; and Ghyczy, Mikols, 3,700,683.
Schluter, Franz, 3,700,145.

Deutsche Star Kugelhalter GmbH: *See*—
Blaurock, Gunter; Hans, Stender; and Werner, Will, 3,700,271.

Deutsche Texaco Aktiengesellschaft: *See*—
Lange, Hans, 3,700,035.

Devaney, Mark J., Jr., to Eastman Kodak Company. Apparatus for placing marks on a web. 3,700,908, Cl. 250-219.0dr.

Deverman, Kenneth D.; and Struck, Charles R. Rotary hair clipper. 3,699,652, Cl. 30-29.500.

Deverse, Frank T.; Kurtz, John A.; Rendon, Daniel; Trahn, Kenneth A.; and Tuttle, James W., to Cogar Corporation. Vapor deposition apparatus. 3,699,917, Cl. 118-49.000.

Devitt, John P. Apparatus and method for chemically milling the inner wall surface of a hollow shaft. 3,700,509, Cl. 156-5.000.

Devlieg Machine Company: *See*—
Sweeny, Allen N., 3,699,843.

DeVries, James H., to Sarns, Inc. Peristaltic pump construction. 3,700,361, Cl. 417-477.000.

Di Cecco, Thomas. Mushroom puffs. 3,700,467, Cl. 99-104.000.

Diamond International Corporation: *See*—
Reifers, Richard F., 3,700,096.
Struble, Glenn E., 3,699,598.

Dicke, Robert H., to Research Corporation. Scatterhole camera and method for using same including the step of convoluting the image. 3,700,895, Cl. 250-65.00r.

Dickens, Alvin J., Jr., to Reynolds, R. J., Tobacco Company. Gas suspersion agglomeration. 3,700,461, Cl. 99-26.000.

Diehl, Robert Eugene; and Magee, Richard Joseph, to American Cyanamid Company. 4-Alkylamino-3-nitroquinolines. 3,700,674, Cl. 260-288.00r.

Dietl, Hans K.; and Young, Howard S., to Eastman Kodak Company. Preparation of benzoquinones by oxidation of para-substituted phenols. 3,700,701, Cl. 260-396.00r.

Dietz, William A.: *See*—
Sparling, Raymond T.; and Dietz, William A., 3,700,007.

Diginetics Incorporated: *See*—
Snook, Richard K.; and Stout, Rodney W., 3,700,862.

Digital Equipment Corporation: *See*—
Chace, Donald E.; Melvin, James A., Jr.; Ricketts, Alan W., Jr.; Steinberger, Edward P.; and Symmes, David T., 3,701,113.

Dill, Hans G. Hughes Aircraft Company Insulated gate field effect transistor adapted for microwave applications. 3,700,976, Cl. 317-235.00r.

Dill, Raymond Joseph, to Reynolds Metals Company. Method for manipulating aluminum reduction cell anode pins. 3,700,571, Cl. 204-67.000.

Dillenburg, Helmut; Honig, Helmut; and Moser, Wilhelm. Process for the preparation of granular sodium perborate tetrahydrate of low bulk density and high abrasion resistance. 3,700,414, Cl. 23-302.000.

Diring, James A.; Engel, John B.; and Broeren, John E., to Mosinee Paper Corporation. Tissue dispensing mechanism. 3,700,181, Cl. 242-55.300.

Displaytek Corporation: *See*—
Ruggiero, Edward M., 3,700,852.

Ditges, Ernst, to Press- und Stanzwerk Paul Craemer KG. Die for molding plastic pallets. 3,700,205, Cl. 249-142.000.

Dittman, Kenneth C., to Electro Products Laboratories, Inc. Magnetic pickup with feedback circuit. 3,701,015, Cl. 324-174.000.

Ditto, Edwin D.; and Stone, William S., to General Motors Corporation. Friction welding methods. 3,699,639, Cl. 29-470.300.

Dixon, Richard W. Purse theft alarm. 3,701,140, Cl. 340-283.000.

Dobbs, Richard A.; and Holmes, Richard N., to McDonnell Douglas Corporation. Acoustic face sheet. 3,700,067, Cl. 181-33.

Doddington, George Rowland; Flanagan, James Loton; and Lummis, Robert Carl, to Bell Telephone Laboratories, Incorporated. Automatic speaker verification by non-linear time alignment of acoustic parameters. 3,700,815, Cl. 179-1.0sa.

Dodman, David.; Pearson, Kenneth William; and Woolley, John Mathers, to Imperial Chemical Industries, Limited. Catalysts. 3,700,605, Cl. 252-471.000.

Doerfel, Helmut: *See*—
Mueller, Gerhard; Doerfel, Helmut; and Schmidt-Thomee, Georg, 3,700,751.
Steinhofer, Adolf; Doerfel, Helmut; Falkenstein, Georg; and Jeserich, Wolfgang-Dieter, 3,700,658.

Doherty, Walter G. Pavement repair. 3,699,854, Cl. 94-22.000.

Dohnalova-Binkova, Blanka; and Binek, Bedrich, to Cwskoslovenska akademie ved. Generator of monodisperse aerosols. 3,700,170, Cl. 239-102.000.

Domann, Helmut: *See*—
Adler, Karl-Heinz; Domann, Helmut; and Locher , Johannes, 3,701,041.

Domba, Elemer, to Nalco Chemical Company. Quaternary fluorsilicon dispersant. 3,700,844, Cl. 260-404.500.

Donald, Harold J.: *See*—
Hearns, Harold L.; and Donald, Harold J., 3,700,370.

Donaldson, Peter Eden Kirwan: *See*—

Brindley, Giles Skey; and Donaldson, Peter Eden Kirwan, 3,699,970.

Donich, Thomas G.: *See—*
Charters, Robert L.; Bartlemay, James M.; Folline, John M.; and Donich, Thomas G., 3,701,120.

Donnels, Wayne T., to Walker Boudwin Construction Co., Inc., The. Adjustable brace for tilt-up construction. 3,700,202, Cl. 248-354.00c.

Donohue, Robert J.; and Joseph, Bernard W., to General Motors Corporation. Faceted reflector for lighting unit. 3,700,883, Cl. 240-41.360.

Dornier System GmbH: *See—*
Kubler, Manfred, 3,700,190.

Dornier Systems G.m.b.H.: *See—*
Hoff, Gunter; and Langbein, Gerhard, 3,700,488.

Dosdat, Jean: *See—*
Bidault, Michel; Dosdat, Jean; Lelay, Roland; and Parouty, Jran Claude, 3,699,647.

Dostal, Frank; and Badowski, Charles, to Bulova Watch Company, Inc. Optical switch mechanism. 3,700,304, Cl. 350-6.000.

Dostal, Zdenek Denny, to International Playtex Corporation. Tampon for absorbing body fluids. 3,699,965, Cl. 128-285.000.

Dougherty, Charles B., to TRW Inc. Image analysis and correlation system and method. 3,700,801, Cl. 178-6.800.

Dow Chemical Company, The: *See—*
Hearns, Harold L.; and Donald, Harold J., 3,700,370.
Pawloski, Chester E.; and Stewart, Russell L., 3,700,735.
Sonnabend, Lawrence F., 3,700,493.

Drabb, Thomas Walter, Jr.: *See—*
Addor, Roger Williams; and Drabb, Thomas Walter, Jr., 3,700,772.

Drapeau, Raoul E., to Slope Incorporated. Impactless printer. 3,700,807, Cl. 178-30.

Dray, af.Annapolis, d., to UnitedStatesof America,Navy. Piston type thrustbearing. 3,700,293, Cl. 308009.000.

Dreismann, Robert: *See—*
Teske, Fritz; Teske, Lothar; and Dreismann, Robert, 3,700,248.

Driole, Jean: *See—*
Bonnier, Etienne; Allibert, Colette; Driole, Jean; and Wicker, Alain, 3,700,428.

Du Pont de Nemours, E. I., and Company: *See—*
Altau, Karl, 3,700,491.
Cairncross, Allan; and Sheppard, William Arthur, 3,700,693.
Cole, John Elton, Jr., 3,700,398.
Mc Kusick, Blaine Chase, 3,700,689.
Sullivan, Robert H., 3,700,731.

Dubuque Awning & Tent Company: *See—*
Frommelt, Cyril P.; and Frommelt, Sylvan J., 3,699,733.

Dufour, Raymond J.; and Grimm, James J., to Northern Illinois Gas Company. Internal pipe sealing device. 3,700,265, Cl. 285-15.000.

Duhl, David N., to United Aircraft Corporation. Enhancement of transverse properties of directionally solidified superalloys. 3,700,433, Cl. 148-32.500.

Duke, David A., to Corning Glass Works. Glass-ceramic articles. 3,700,471, Cl. 106-39.0dv.

Dukes, John N., to Hewlett-Packard Company. D. C. motor circuit for rotating a polarizer and providing a detector synchronizer signal for a laser stabilizing system. 3,701,042, Cl. 331-94.500.

Duncan, Alan W., to Sears, Roebuck and Company. Combination gate hinge and closer. 3,699,615, Cl. 16-184.000.

Duncan, John E. Adjustable hysteresis clutch and brake. 3,700,941, Cl. 310-105.000.

Dunkelis, Evald, to GPE Controls, Inc. Vertical jet breather valve. 3,699,999, Cl. 137-493.400.

Dunkley, Keith William: *See—*
Shrimpton, Ronald Horace; and Dunkley, Keith William, 3,700,541.

Dunlop Company Limited, The: *See—*
Mortimer, Frank R.; Brewster, Alan R.; and Bartram, Michael J., 3,700,075.

Dunseath, Edward. Fuel lock. 3,700,063, Cl. 180-114.000.

Duplan Corporation, The, mesne: *See—*
Anderson, Sven; and Lombardo, Anthony, 3,699,907.

Durney, George P., to ILC Industries, Inc. Spacesuit thigh restraint assembly. 3,699,589, Cl. 2-2.100.

Durst, Richard R.; and Uelzmann, Heinz, to General Tire & Rubber Company, The. Titanium trihalide-amine hydrohalide complexes. 3,700,707, Cl. 260-429.500.

Duschinsky, Robert: *See—*
Beaman, Alden Gamaliel; Duschinsky, Robert; and Tautz, William Paul, 3,700,698.

Dusek, Ervin F., to Reliable Manufacturing Corporation. Popcorn popper. 3,699,874, Cl. 99-238.100.

Dynamit Nobel Aktiengesellschaft: *See—*
Jung, Karl-Heinz; and Gartner, Klaus-Gunther, 3,700,641.

Dyonics Inc.: *See—*
Humphrey, William G., Jr.; and Rishton, Michael L., 3,699,950.

Dzerzhinsky Filial Nauchno-Issledovatelskogo i Konstruktorskogo Instituta Khimicheskogo Mashinostroenia: *See—*
Vagin, Alexei Alexeevich; Yablonsky, Stanislav Valerievich; Voloshin, Petr Stepanovich; Sharov, Nikolai Grigorievich; Shiborin, Viktor Ivanovich; Novakovsky, Vladimir Efimovich; Kolpakov, Grigory Vasilievich; Ivanov, Mark Efremovich; Lindin, Viktor Mikhailvich; and Lipsky, Daniil Yakovlevich, 3,700,364.

E-System, Inc.: *See—*
Deering, Charles S., 3,700,987.

E-System, Inc., mesne: *See—*
Uary, Joe D., 3,700,209.

Easoz, Robert D., to North American Rockwell Corporation. Composite fountain blade construction for remote ink control system. 3,699,888, Cl. 101-365.000.

Eastler, William E., Jr., to Itek Corporation. Transparent imaging medium. 3,700,437, Cl. 96-8.000.

Eastman Kodak Comny: *See—*
Kindig, Guilford Edwin, 3,699,862.

Eastman Kodak Company: *See—*
Bracken, Thomas W., 3,699,834.
Bradford, James C.; Miller, Stephen H.; and Robertson, Jeffrey C., 3,700,188.
Brewer, Waldo L; and Laukaitis, Joseph F., 3,700,320.
Burnham, William L., 3,700,186.
Cooley, Austin C., 3,700,450.
Devaney, Mark J., Jr., 3,700,908.
Dietl, Hans K.; and Young, Howard S., 3,700,701.
Gabrielsen, Rolf S.; and Olivares, Ismael A., 3,700,442.
Guyette, Franklin L.; and Frank, Donald R., 3,700,323.
Hickey, Lionel Russell, 3,700,906.
Hillson, Peter John; and Ridgway, Michael, 3,700,448.
Jensen, Einar W., 3,699,869.
Johnson, Sam H., Jr.; and Wright, Howard N., Jr., 3,700,726.
Johnson, Sam H., Jr.; Mears, Robert A.; and Park, Vernon K., 3,700,758.
Knechel, William F., 3,700,453.
Laisney, Alexis D., 3,700,218.
Lindholm, Robert D., 3,700,458.
Pierson, Charles W., 3,700,532.
Seelbinder, David C., 3,700,335.
Smith, Donald A., 3,700,456.
Smith, Gerald C.; and Williams, Raymond J., 3,699,832.
Thomson, Kenneth W., 3,700,187.
Wiegert, Albert Carl; and Schoonmaker, Edward Balmor, 3,700,232.
Youngquist, Mary J., 3,700,457.

Eaton Corporation: *See—*
Keene, Derek K.; and Mc Elhare, John J., 3,700,060.

Eaton Yale & Towne, Inc.: *See—*
Pacak, Matthew, 3,700,382.

Eaves, Randall H., to De Sota, Inc. Draw means for sliding screen and the like. 3,700,022, Cl. 160-126.000.

Eck, Leonard F. Trailer. 3,700,254, Cl. 280-63.000.

Eckenbrecht, Robert Roy, to GTE Sylvania Incorporated. Flying spot scanner for continuously advanced film. 3,700,795, Cl. 178-7.200.

Eckert, Konrad; Eheim, Franz; Hofer, Gerald; and Koster, Claus, to Bosch, Robert, G.m.b.H. Fuel injection pump for internal combustion engines and method of fuel control. 3,699,939, Cl. 123-140.00j.

Eckle, Otto, to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH. Boring bar insert. 3,700,346, Cl. 408-153.000.

Economics Laboratory, Inc.: *See—*
Mizuno, William G.; Copeland, James L.; and Scholze, Arlene E., 3,700,599.

Eddowes, Alfred M.: *See—*
Gagliardi, Richard P.; Beans, Allen F.; Eddowes, Alfred M.; and Greenblatt, Herbert, 3,701,153.

Edwards, Clarence K.; and Edwards, Lawrence D. Machine for making packaging components of foam material. 3,700,371, Cl. 425-144.000.

Edwards, Clarence K.; and Edwards, Lawrence D. Model railway switch assembly. 3,700,889, Cl. 246-415.00a.

Edwards, Lawrence D.: *See—*
Edwards, Clarence K.; and Edwards, Lawrence D., 3,700,371.
Edwards, Clarence K.; and Edwards, Lawrence D., 3,700,889.

Egawa, Susumu; Ashizaki, Shigeya; Shimizu, Katsumi; and Miyati, Toshiko, to Matsushita Electric Industrial Co., Ltd. Color picture tube device. 3,700,954, Cl. 315-13.00c.

Eggington, Wilfred J., to Aerojet-General Corporation. Fluid cushion cells for fluid cushion vehicles. 3,700,065, Cl. 180-128.000.

Eggleston, Donald A.; and Samuel, Trevor N., to Sangamo Electric Company. Watthour meter indicator with improved cam and microswitch operator structure. 3,700,839, Cl. 200-56.00r.

Egli, Paul H.: *See—*
United States of America, National Aeronautics and Space Administration, 3,700,575.

Ehe, Albert L., to Multiculp Automation Company. Apparatus for assembling and gluing paper cups in tray formation. 3,700,530, Cl. 156-559.000.

Eheim, Franz: *See—*
Eckert, Konrad; Eheim, Franz; Hofer, Gerald; and Koster, Claus, 3,699,939.

Ehrlich, Richard D.: *See—*
Jacky, Germaine F.; and Ehrlich, Richard D., 3,700,482.

Eibe, Werner W., to Blaw-Knox Foundry & Mill Machinery, Inc. Work roll bearing lubrication arrangement. 3,699,791, Cl. 72-45.000.

Eibe, Werner W.; and Farrell, Wilfred T., Jr., to Blaw-Knox Company. Work roll changers. 3,699,796, Cl. 72-239.000.

Ekman, Carl F. W.: *See—*

Ravich, Leonard E.; Berman, Elliot; and Ekman, Carl F. W., 3,700,447.

Elder, Fred Grove: *See—*
Brey, Wilhelm; Hostetler, William; Loeffler, Earl Ferdnand; Kolm, Hubert Ernest; and Elder, Fred Grove, 3,700,526.

Electro Marine Corporation: *See—*
Burns, Harold S., 3,699,658.

Electro Products Laboratories, Inc.: *See—*
Dittman, Kenneth C., 3,701,015.

Electronic Data Systems Corporation: *See—*
Spraker, Earl D., 3,700,814.

Electronic Image Systems Corporation: *See—*
Wernikoff, Robert E., 3,700,797.

Eleftherion, Michael P.: *See—*
Cranston, Benjamin H.; and Eleftherion, Michael P., 3,699,640.

Elektra-Bregenz G.m.b.H.: *See—*
Gehrmann, Hasso, 3,699,780.

Ellin, Seymour: *See—*
Burgarella, John P.; and Ellin, Seymour, 3,699,861.

Elliott, Bernard V., to Proce, H. C., Co. Self-aligning band for beleving machine. 3,700,223, Cl. 266-23.0nn.

Ellis, Clarence E. Combined charcoal grill and pit barbecue cooker. 3,699,876, Cl. 99-259.000.

Ellis, Nyron P.; Czubak, Albin S.; and McDonald, Keith A., to Micromatic Hone Corporation. Method for simultaneously machining the center bore of a gear workpiece and the end faces perpendicular to the axis of the center bore. 3,699,724, Cl. 51-287.000.

Elverum, Gerard W., Jr., to TRW Inc. Liquid propellant rocket coaxial injector. 3,699,772, Cl. 60-39.74a.

Emerson Electric Co.: *See—*
Munson, Robert D., 3,700,962.

Emery Industries, Inc.: *See—*
Sharkey, Hubert Joseph; and Sturwold, Robert J., 3,700,618.

Emhart Corporation: *See—*
Gerlach, John R.; and Morrensen, Clarence B., 3,699,788.

Enarsson, Knut, to Aktiebolaget Kalle-Regulatorer. Sealing device for introduction of a vertical rotary shaft through an upper wall of a container or pipe. 3,700,246, Cl. 277-3.000.

Endress, James W.: *See—*
Anderson, Carl M.; and Endress, James W., 3,700,355.

Engalitcheff, John, Jr., to Baltimore Aircoil Company, Inc. Fluid strainer. 3,700,110, Cl. 210-308.000.

Engel, John B.: *See—*
Diring, James A.; Engel, John B.; and Broeren, John E., 3,700,181.

Engelhard, Philippe: *See—*
Weisang, Joseph Edouard; and Engelhard, Philippe, 3,700,588.

Englund, Gosta Roland; Eriksson, Bjorn Sven Hilding; Mattsson, Mats Erik; and Lindelow, Claes-Goran, to Svenska Dataregister AB. Control apparatus. 3,700,863, Cl. 235-62.00f.

Ensinger, Willis B., to Singer Company, The, mesne. Flexure hinge assembly. 3,700,290, Cl. 308-2.00a.

Environment/One Corporation: *See—*
Naydan, Theodore T.; and Aker, Walter W., 3,700,169.

Enzomedic Laboratories, Inc.: *See—*
Brusca, Donald R., 3,700,654.

Epifano, Robert Nicholas; and Jordan, Eugene Leon, to RCA Corporation. Method of making a semiconductor device including a polyimide resist film. 3,700,497, Cl. 117-212.000.

Ericson, Richard E., to Bard, C. R., Inc. Closed urinary drainage and irrigation system. 3,699,964, Cl. 128-275.000.

Eriksson, Bjorn Sven Hilding: *See—*
Englund, Gosta Roland; Eriksson, Bjorn Sven Hilding; Mattsson, Mats Erik; and Lindelow, Claes-Goran, 3,700,863.

Erlichman, Irving, to Polaroid Corporation. Self-developing reflex camera. 3,699,865, Cl. 95-42.000.

Erste Deutsche Floatglas GmbH & Co.: *See—*
Pernet, Michel, 3,700,424.

ESB Inc.: *See—*
Dermody, William J.; and Varker, Alan E., 3,700,628.

Esbeck, Howard Christian: *See—*
Hentrich, Robert Dale; Esbeck, Howard Christian; and Arnold, Loren Glenn, 3,700,037.

E.S.E. Limited: *See—*
Lang, Gordon R., 3,701,012.

Eshelman, Philip V. Throttle return spring redundancy system. 3,699,943, Cl. 123-198.0db.

Essex, Duane Arnold, to Deere & Company. Adjustable spring trip shank assembly. 3,700,038, Cl. 172-625.000.

Essex, Duane Arnold; Haverdink, Virgil Dean; and Hill, Donald Allan, to Deere & Company. Spring trip shank assembly. 3,700,039, Cl. 172-265.000.

Esso Production Research Company: *See—*
Terry, William M.; Graham, John W.; Sinclair, Albert R.; and Kiel, Othar M., 3,700,032.

Esso Research and Engineering Company: *See—*
Cier, Harry E., 3,700,640.
Salamony, James E.; and Starnes, William H., Jr., 3,700,583.
Schulman, Bernard L., 3,700,586.

Estes, John C., to Bethlehem Steel Corporation. Apparatus and method for removing and/or adding column sections to a column of a marine structure. 3,699,688, Cl. 61-46.500.

Etablissements Ruby S.A.: *See—*
Chapuis, Robert, 3,699,966.

Ethyl Corporation: *See—*
Plonsker, Larry; Perilstein, Warren L.; and Malec, Robert E., 3,700,598.

European Atomic Energy Community (Euratom): *See—*
Gaggero, Giancarlo; Mongini-Tamagnini, Carla; and Settipani, Antoine, 3,700,162.

Evans, Richard O.: *See—*
Craig, Robert D.; Evans, Richard O.; and Grant, Gerald F., 3,699,734.

Evans, Robert G. Two-stage drop hammer for driving large diameter pilling. 3,700,046, Cl. 173-103.000.

Evans, Ross Hugh; Seltzer, Daniel Arron; and Young, Robert Leonard, to Gamon-Calmet Industries, Inc. Telemetering remote recording unit. 3,700,816, Cl. 179-2.0dp.

Evans, William L.: *See—*
Lunsford, Leslie E.; Simmons, Clyde A.; and Evans, William L., 3,699,664.

Everest, Charles E.; and Voznick, Henry P., to Wahl, William, Corporation. Electromechanical intervalometer, and method of using same. 3,700,971, Cl. 317-80.000.

EVG Entwicklungs- und Verwertungsgesellschaft m.b.H.: *See—*
Ritter, Klaus; Gott, Hans; Ritter, Josef; and Ritter, Gerhard, 3,699,756.

Eyler, Francis R., to Bendix Corporation, The. Frequency independent peak detector. 3,700,920, Cl. 307-235.00a.

Fabbrica Italiana Magneti Marelli S.p.A.: *See—*
Basso, Eugenio; Ravaschio, Guglielmo; and Frangilli, Vittorio, 3,701,000.

Fabian, Wolfgang: *See—*
Sevenich, Theodor Josef; Fabian, Wolfgang; and Kuhn, Klaus, 3,700,122.

Fader, John H.; Keijzer, Johan H.; and Graulus, Marcel Josef Roger, to Monroe Belgium N.V. Combination shock absorber and supplementary air spring unit and method of assembling same. 3,700,225, Cl. 267-35.000.

Fahlstrom, Rune: *See—*
Westberg, Bengt Karl-Axel; Odman, Tor Axel; and Fahlstrom, Rune, 3,699,878.

Falkenstein, Georg: *See—*
Steinhofer, Adolf; Doerfel, Helmut; Falkenstein, Georg; and Jeserich, Wolfgang-Dieter, 3,700,658.

Fancher, Llewellyn W., to Stauffer Chemical Company. 2-Aminobenzothiazol phosphates and phosphonates used as insecticides. 3,700,771, Cl. 424-200.000.

Fang, Yang, to International Business Machines Corporation. Phase jitter extraction method for data transmission systems. 3,701,023, Cl. 325-329.000.

Fannin, Wayne V.: *See—*
Jackson, George W.; Long, Paul J., Jr.; and Fannin, Wayne V., 3,700,273.

Fanton, Ralph E.: *See—*
Gach, Francis X.; Fanton, Ralph E.; and Hazzard, Noel D., 3,699,905.

Farbenfabriken Bayer Aktiengesellschaft: *See—*
Fest, Christa; Hammann, Ingeborg; and Behrenz, Wolfgang, 3,700,686.

Farbenfabriken Bayer Aktiengesellschaft: *See—*
Hoffmann, Hellmut; Hamman, Ingeborg; and Homeyer, Bernhard, 3,700,687.

Farnsworth, David L.: *See—*
Fletcher, James C., Administrator of The National; Aeronautics and Space Administration with respect; to an invention of; List, William F.; and Farnsworth, David L., 3,700,961.

Farnsworth, Robert P.: *See—*
Dahlinger, Rodney J.; and Farnsworth, Robert P., 3,700,913.

Farrell, John D., to Massillon Container Co. Basket construction. 3,700,160, Cl. 229-34.00r.

Farrell, Wilfred T., Jr.: *See—*
Eibe, Werner W.; and Farrell, Wilfred T., Jr., 3,699,796.

Fath, Joseph; and Rosen, Marvin, to Tenneco Chemicals, Inc. Aqueous surface-coating compositions containing hydroxyalkyl ethers of galactomannan gums as thickeners. 3,700,612, Cl. 260-17.4st.

Faust, Elbert R., to M & T Chemicals Inc. Continuous plating system. 3,699,985, Cl. 134-141.000.

Feldcamp, Edward George. Method of finishing an aperture. 3,699,725, Cl. 51-317.000.

Fendley, Samuel J.: *See—*
Fineran, Dennis E.; and Fendley, Samuel J., 3,701,144.

Fenton, Donald M., to Union Oil Company of California. Preparation of aromatic acids. 3,700,729, Cl. 260-515.00r.

Ference, Richard N.; Grega, Albert; Miller, James A.; Stewart, Ray T.; and Stricker, David M., to Aluminum Company of America. Container inspection apparatus. 3,700,101, Cl. 209-80.000.

Fernsteuergerate Zacharia-Oelsch-Meier: *See—*
Lieber, Hans-Wilhelm; and Kramer, Rolf, 3,701,010.

Ferrant, Wolfgang, to Ransburg Electro-Coating Corporation. Spray coating apparatus. 3,700,168, Cl. 239-3.000.

Ferrentino, Antonio, to Industrie Pirelli Societa per Azioni. Helical waveguide. 3,701,060, Cl. 333-95.00a.

Ferro Corporation: *See—*
Golownia, Robert F.; and Oswitch, Stanley, 3,700,617.

Fest, Christa; Hammann, Ingeborg; and Behrenz, Wolfgang, to Farbenfabriken Bayer Aktiengesellschaft. 0-alkyl-0-pyrazolyl-phosphoric, phosphonic, thionophosphoric and thionophosphonic acid esters. 3,700,686, Cl. 260-310.00r.

Fiber Controls Corporation: *See—*

Lytton, Kenneth G.; Hullett, David F.; and Miller, George J., 3,700,091.

Fickenwirth, Frederick I.; and Van Wyk, Jan W., to United States of America, Federal Aviation Administration. Flexible oscillatory motion bearing seal. 3,700,297, Cl. 308-187.200.

Finch, Albert M. T., Jr., to Shell Oil Company. Diene-nitrile rubbers. 3,700,637, Cl. 260-83.300.

Fineran, Dennis E.; and Fendley, Samuel J., to United States of America, Navy. High frequency analog-to-digital converter. 3,701,144, Cl. 340-347.0ad.

Finnegan, Edward D.; Harper, Leonard Roy; Mitrofanoff, Nicholas S.; and Slutman, Allen C., to International Business Machines Corporation. Central processing unit in which all data flow passes through a single arithmetric and logic unit. 3,701,105, Cl. 340172.500.

Firestone Tire & Rubber Company, The: *See—*
Brey, Wilhelm; Hostetler, William; Loeffler, Earl Ferdnand; Kolm, Hubert Ernest; and Elder, Fred Grove, 3,700,526.

Fischer, Thomas R., to Cincinnati, Melacron Inc. Apparatus for controlling relative motion between gage jaws on a contacting gage. 3,700,993, Cl. 318-603.000.

Fitzgerald, Donald F.: *See—*
Knowles, James H.; Ball, Billie Joe; and Fitzgerald, Donald F., 3,701,024.

Flanagan, James Loton: *See—*
Doddington, George Rowland; Flanagan, James Loton; and Lummis, Robert Carl, 3,700,815.

Flaviani, Edmond. Apparatus for recovery of floating substances. 3,700,107, Cl. 210-242.000.

Fleissner, Heinz: *See—*
Janisch, Ingo; and Fleissner, Heinz, 3,700,404.

Fletcher, James C., Administrator of The National; Aeronautics and Space Administration with respect; to an invention of; List, William F.; and Farnsworth, David L. Phototransistor imaging system. 3,700,961, Cl. 315-169.0tv.

Florida Gas Company: *See—*
Wonderly, Clifford L., 3,700,522.

Fluid Energy Processing & Equipment Company: *See—*
Stephanoff, Nicholas N., 3,699,662.

Flux, Peter John, to Westland Aircraft Limited. Tail rotor hub assembly for rotary wing aircraft. 3,700,351, Cl. 416-123.000.

FMC Corporation: *See—*
Peter, Alfred O., 3,699,895.
Price, John A.; and Stewart, Mary J., 3,700,644.
Wilson, Donald C., 3,699,875.

Foley, Nelson D., to United States of America, Navy. Selective signal tuning device. 3,701,025, Cl. 325-470.000.

Folline, John M.: *See—*
Charters, Robert L.; Bartlemay, James M.; Folline, John M.; and Donich, Thomas G., 3,701,120.

Fonofilm Industri A/S: *See—*
Anneberg, Vilhelm; Clemmensen, Ellen; Gudmandsen, Robert; and Scheibel, Axel, 3,700,829.

Foote, James B.: *See—*
Allgeyer, Guy H.; and Foote, James B., 3,699,902.

Ford, Bryce W.; Meyer, Daniel A.; and Warner, Walter C., to General Tire & Rubber, The. Dynamic testing device for visco-elastic materials. 3,699,808, Cl. 73-91.000.

Ford Motor Company: *See—*
Forsting, Bernard; Hellriegel, Edmund; and Pfadenhauer, Dieter, 3,700,076.
Francis, Reid Eugene, 3,700,184.
Gawel, Walter J., 3,699,909.
Heintz, Walter K.; and Unnewehr, Lewis E., 3,700,943.
Heintz, Walter K., 3,700,944.
Staudenmayer, Karl, 3,699,824.
Vartanian, Richard D., 3,699,936.

Fork, Werner, to Voith, J. M., G.m.b.H. Control system for a bladewheel propeller. 3,700,349, Cl. 416-111.000.

Forsting, Bernard; Hellriegel, Edmund; and Pfadenhauer, Dieter, to Ford Motor Company. Side protection device for motor vehicles. 3,700,076, Cl. 188-1.00c.

Foster, Edwin E.; Foster, Wilbur A.; and Foster, Thomas E., to Majik-Irons, Inc. Ironing apparatus. 3,699,673, Cl. 38-30.000.

Foster, Thomas E.: *See—*
Foster, Edwin E.; Foster, Wilbur A.; and Foster, Thomas E., 3,699,673.

Foster, Wilbur A.: *See—*
Foster, Edwin E.; Foster, Wilbur A.; and Foster, Thomas E., 3,699,673.

Foults, Jonathan Asa, to Scovill Manufacturing Company. Filling and valving assembly for radiator system. 3,700,166, Cl. 236-34.500.

Fowler, Dean A., to Cache Valley Dairy Association. Cheese mold apparatus. 3,700,373, Cl. 425-195.000.

Foxboro Company, The: *See—*
Shinskey, Francis G., 3,699,665.

Franc, Charles. Illumination device. 3,700,879, Cl. 240-10.00r.

Francis, Gerald A.: *See—*
Bartilson, Benjamin M.; and Francis, Gerald A., 3,700,010.

Francis, Reid Eugene, to Ford Motor Company. Seat belt retraction disabling device. 3,700,184, Cl. 242-107.400.

Francis, Theodore R. Noise reduction canopy device for machinery. 3,700,068, Cl. 181-33.00k.

Frangilli, Vittorio: *See—*
Basso, Eugenio; Ravaschio, Guglielmo; and Frangilli, Vittorio, 3,701,000.

Frank, Donald R.: *See—*
Guyette, Franklin L.; and Frank, Donald R., 3,700,323.

Fraser, David Bruce, to Bell Telephone Laboratories, Incorporated. Fine grain ferroelectric ceramic optical display device utilizing thermal depoling write-in. 3,701,121, Cl. 340-173.200.

Frazier, Raymond R. Gas expander. 3,699,938, Cl. 123-122.00e.

Frederiksen, Thomas M., to Motorola, Inc. Integrated bistable circuit. 3,700,929, Cl. 307-291.000.

Frederiksen, Thomas M.; and Long, Ernest L., to Motorola, Inc. Complementary power amplifier. 3,701,031, Cl. 330-17.000.

Freedman, Frank B. Parabiotic dialysis apparatus. 3,699,960, Cl. 128-214.00b.

Freeland, Edward J., to Gulf & Western Industrial Products, Company. Machine control circuit. 3,700,991, Cl. 318-447.000.

Frei, Alfred; and Schweizer, August, to Sandoz Ltd. Dye preparations containing a metallized disazo dye and monopropanolamine. 3,700,653, Cl. 260-148.000.

Frei, Armin H., to International Business Machines Corporation. Analog to digital converter. 3,701,148, Cl. 340-347.0ad.

Freijd, Ingvar: *See—*
Schullstrom, Sten Gunde; Freijd, Ingvar; Schader, Arne; and Olofsson, Nils Gunnar, 3,701,075.

French, Hollis E.: *See—*
McLeod, Gerald L.; French, Hollis E.; Case, Laura K.; Berman, Elliot; and Casella, Joseph, 3,700,440.

Fried, Norman: *See—*
Karr, Lawrence J.; and Fried, Norman, 3,700,313.

Friedman, Arthur S., to Carey Press Corporation. Book having subdivisions and means to locate the first leaf of each subdivision. 3,700,264, Cl. 283-38.000.

Friedman, Moshe; and Ury, Michael G., to United States of America, Navy. High power pulsed electron beam. 3,700,945, Cl. 313-84.000.

Friedrich Schatz; Stachewski, Harry; and Lehnert, Gunther; deceased (by Lehnert, Gerda; Administratrix). Apparatus for making thin walled metal tubing. 3,700,158, Cl. 228-15.000.

Frische, Andrew Ferdinand, to Brown & Williamson Tobacco Corporation. Cigarette. 3,699,972, Cl. 131-9.000.

Fritschi, Walter William, to Bell Telephone Laboratories, Incorporated. Arrangement for reducing glare on two-way trunk. 3,700,822, Cl. 179-18.0ah.

Froio Corporation: *See—*
Froio, Nicholas J., 3,700,078.

Froio, Nicholas J., to Froio Corporation. Speed retarding device. 3,700,078, Cl. 188-180.000.

Frommelt, Cyril P.; and Frommelt, Sylvan J., to Dubuque Awning & Tent Company. Loading dock shelters. 3,699,733, Cl. 52-204.000.

Frommelt, Sylvan J.: *See—*
Frommelt, Cyril P.; and Frommelt, Sylvan J., 3,699,733.

Frossard, Jacques Jean: *See—*
Weber, Abraham; and Frossard, Jacques Jean, 3,700,663.

Frosst, Charles E., & Co.: *See—*
Wasson, Burton K.; and Williams, Haydn W. R., 3,700,691.

Frutschi, Hans Ulrich, to Brown Boveri-Sulzer Turbomasinen Aktiengesellschäft. Load control for gas turbine plant. 3,699,681, Cl. 60-59.00t.

Frydenberg, Donald V., to Clary Corporation. Method and apparatus for making wall panels. 3,699,622, Cl. 29-155.00r.

Fuhrman, Nathan, to United States of America, Atomic Energy Commission. Electrochemical carbon meter. 3,700,568, Cl. 204-1.00t.

Fuji Denki Seizo Kabushiki Kaisha: *See—*
Miyoshi, Noriomi, 3,700,970.

Fuji Photo Film Co., Ltd.: *See—*
Hiyosi, Hirosi; and Kanda, Masao, 3,700,490.
Kurechi, Taichi, 3,700,316.

Fujii, Tatsuo; and Tomomitsu, Toshio, to Nippon Kogaku K.K. Structure of exposure measuring device using two galvanometers. 3,700,337, Cl. 356-227.000.

Fujimoto, Sakae, to Ricoh Co., Ltd. Device for adjusting position of light source for projectors and the like. 3,700,884, Cl. 240-44.200.

Fujisawa, Mitsumaro: *See—*
Sato, Wasuke; Hatakeyama, Shigeyuki; Koide, Masashi; Yamamoto, Sadao; and Fujisawa, Mitsumaro, 3,700,523.

Fujitsu Limited: *See—*
Kinoshita, Ryohei; and Ishizawa, Masami, 3,701,064.

Fukuda, Masataro: *See—*
Watanabe, Nobuatsu; and Fukuda, Masataro, 3,700,502.

Fukui, Kiyoshi: *See—*
Masaki, Mitsuo; Fukui, Kiyoshi; Kuramasu, Tetsuro; and Ueda, Masahiro, 3,700,656.

Fukuoka, Ichiro; Takahashi, Satoshi; and Yagi, Norio, to Denki Kagaku Koyo Kabushiki Kaisha. Process for preparing mercapto-terminated chloroprene copolymers. 3,700,645, Cl. 260-77.5cr.

Fukushima, Kunihiko: *See—*
Yamaguchi, Yukiya; Fukushima, Kunihiko; Yasuda, Minoru; and Nagata, Shojiro, 3,701,095.

Fulkerson, David E., to Honeywell Inc. Differential snap acting switching circuit. 3,700,924, Cl. 307-255.000.

Fuller Company: *See—*
Talgo, Paul, 3,700,220.

Fuller, Melvin L., to Litton Systems, Inc. Photo-select memory switch. 3,701,117, Cl. 340-173.00r.

Fullner, Hans Jurgen: *See—*
Gentsch, Erich; Bederke, Klaus; Seider, Walter; Fullner, Hans Jurgen; and Muhlmann, Christa, 3,700,483.

Funakiskp, Sayoko: *See—*

Adachi, Toshio; Funakiskp, Sayoko; Furuya, Akio; and Uchida, Masakatsu, 3,700,624.

Furman, Anatol, to International Business Machines Corporation. Fast acting turn-off circuit. 3,700,922, Cl. 307-246.000.

Furmansky, Mordechay: *See—*
Bloch, Rene A.; Furmansky, Mordechay; and Gassner, Saul, 3,700,576.

Furnival, Thomas J., to General Motors Corporation. Repairable semiconductor assembly. 3,700,969, Cl. 317-40.00r.

Furst, Andor; Muller, Marcel; Muller, Peter; Schocher, Arne Johannes; and Bacher, Elisabeth, to Hoffmann-La Roche, Inc. 15,16-Methylene steroids. 3,700,702, Cl. 260-397.450.

Furuya, Akio: *See—*
Adachi, Toshio; Funakiskp, Sayoko; Furuya, Akio; and Uchida, Masakatsu, 3,700,624.

Fymat, Alain L: *See—*
Low, George M, Deputy Administrator of the; National Aeronautics andSpacadnistration with; respect to an invention of; Fymat, Alain L; and Abhyankar, Krishna D India, 3,700,334.

Gabrielsen, Rolf S.; and Olivares, Ismael A., to Eastman Kodak Company. Developing agent precursors. 3,700,442, Cl. 96-29.000.

Gach, Francis X.; Fanton, Ralph E.; and Hazzard, Noel D., to Air Preheater Company, Inc., The. Burner for incinerator. 3,699,905, Cl. 110-8.00a.

Gacs, Peter T.; and Shirzad, Paul P., to General Steel Industries, Inc. Loading bridge structure. 3,699,600, Cl. 14-71.000.

Gaffney, Bernard J., to Conwed Corporation. Method for the extrusion of plastic net and net like structures. 3,700,521, Cl. 156-167.000.

Gaggero, Giancarlo; Mongini-Tamagnini, Carla; and Settipani, Antoine, to European Atomic Energy Community (Euratom). Circular calculator for the solution of problems connected with electro-magnetic radiation penetration. 3,700,162, Cl. 235-78.000.

Gagliardi, Richard P.; Beans, Allen F.; Eddowes, Alfred M.; and Greenblatt, Herbert, to United States of America, Navy. Radar testing in a clutter environment. 3,701,153, Cl. 343-17.700.

Gaipo, Eugene T.; and Mattingly, James E. Extensible lubricant return tube for internal combustion engines. 3,699,934, Cl. 123-90.380.

Galle, Edward N., to Hughes Tool Company. Hydraulic impactor methods and apparatus. 3,699,675, Cl. 60-52.0hf.

Gallegos, James P. Sr. Reaction powered toy flying craft. 3,700,172, Cl. 239-188.000.

Gallina, Harold, to Optisonics Corporation. Control circuit for single frame film advance audio projector. 3,700,319, Cl. 353-15.000.

Gallo, Carl, to American Pollution Control Corporation. Pollution control system. 3,699,906, Cl. 110-8.00e.

Galluzzo, Anthony: *See—*
Davis, Donald A.; and Galluzzo, Anthony, 3,700,300.

Gamon-Calmet Industries, Inc.: *See—*
Evans, Ross Hugh; Seltzer, Daniel Arron; and Young, Robert Leonard, 3,700,816.

Garcia, Armando J.: *See—*
Handler, Elliot; Beasley, Noel F.; Garcia, Armando J.; and May, Richard L., 3,699,712.

Garcia, Julian; and Carroll, James C., to International Telephone and Telegraph Corporation. Single channel carrier telephone system. 3,700,817, Cl. 179-2.50r.

Gardel, Robert; and Gorsky, Egon, to Mattel, Inc. Ballerina doll. 3,700,384, Cl. 46-136.000.

Gardner-Denver Company: *See—*
Sorensen, Clarence A.; and Deremo, Edwin J., 3,700,363.

Garnett, Donald, to Allis-Chalmers Manufacturing Company. Neutral device for internal combustion engine powered trucks. 3,700,062, Cl. 180-101.000.

Garrahan, William F.; Madden, Edwin J.; and Picard, Clarence J. Bandage construction. 3,699,959, Cl. 128-166.000.

Garrett, Howard R.: *See—*
King, Percy; and Garrett, Howard R., 3,699,743.

Garrison, William H., to American Spin-A-Batch Company. Galvanizing apparatus. 3,699,918, Cl. 118-61.000.

Gartner, Klaus-Gunther: *See—*
Jung, Karl-Heinz; and Gartner, Klaus-Gunther, 3,700,641.

Gartner, Michael A. Fence post driver. 3,700,047, Cl. 173-124.000.

Garvey, Francis J.; and Winterbottom, Bruce, to Carrier Craft Corporation. Sanding hand tool. 3,699,729, Cl. 51-391.000.

Garwood, William E.: *See—*
Chen, Nai Yuen; Lucki, Stanley J.; and Garwood, William E., 3,700,585.

Gas Council, The: *See—*
Howard, David Campbell, 3,700,270.

Gasche, Urs; Lindlar, Herbert; Rutishauser, Max; and Steiner, Riedholz Kurt, to Hoffmann-La Roche Inc. Process for producing xylose. 3,700,501, Cl. 127-43.000.

Gasellschaft fur Kernforschung m.b.H.: *See—*
Malang, Siegfried, 3,700,553.

Gassmann, Hans Ulrich; and Mugnier, Michel, to Ciba-Geigy AG. Capillary viscometer. 3,699,804, Cl. 73-55.000.

Gassner, Saul: *See—*
Bloch, Rene A.; Furmansky, Mordechay; and Gassner, Saul, 3,700,576.

Gaulier, Jean-Claude, to Compteurs-Schlumberger Montroage. Threshold responsive scale. 3,700,055, Cl. 177-204.000.

Gaum Myron G.: *See—*
Wald, Milton M.; and Gaum Myron G., 3,700,633.

Gawel, Walter J., to Ford Motor Company. Welt tension apparatus. 3,699,909, Cl. 112-152.000.

Gay, Michael J., to Motorola, Inc. Controlled hysteresis trigger circuit. 3,700,921, Cl. 307-235.000.

Gehrmann, Hasso, to Elektra-Bregenz G.m.b.H. Top opening refrigerator device. 3,699,780, Cl. 62-378.000.

Gelfman, Ephrem J. Method and apparatus for cutting glass bottles and the like. 3,699,829, Cl. 82-92.000.

Geltman, Gerald L.: *See—*
Kastenbein, Ernest L.; and Geltman, Gerald L., 3,700,597.

Gem Products, Inc.: *See—*
Johnsen, Eric C., 3,701,068.

General Alarm Corporation: *See—*
Colman, Robert, 3,700,813.

General American Transportation Corporation: *See—*
Levin, Paul; and Adamski, Maximilian, 3,699,881.

General Electric Company: *See—*
Anderson, John M., 3,701,003.
Berger, Abe; and Selin, Terry G., 3,700,711.
Berger, Abe, 3,700,715.
Berger, Abe; and Selin, Terry G., 3,700,716.
Berman, Max; and Bowen, Gary W., 3,701,102.
Bristow, Robert H., 3,700,420.
Corsmeier, Robert J.; Howell, Thomas G.; Corrigan, Charles E.; and Koff, Bernard L., 3,700,348.
Cushman, Paul G.; and Clark, Albert A., 3,700,986.
Davis, Donald Y.; and Coffinberry, George A., 3,699,774.
Hoppin, George S., III; Yount, Reed E.; Berry, Thomas F.; and Barker, James F., 3,700,427.
Kullman, William G., 3,700,856.
Lake, William H., 3,700,960.
Noble, Philip S.; and Chapin, James R., 3,700,128.
Razzano, John S.; and Smith, Alfred H., 3,700,473.
Relles, Howard M., 3,700,743.
Rodbell, Donald Stanley; and Lommel, James M., 3,700,500.
Schuning, Kenneth W.; and Carlson, Eugene E., 3,699,773.
Slomski, Stanley L., 3,700,881.
Timperman, Eugene L., 3,700,189.
Waugh, Richard A., 3,699,785.

General Foods Corporation: *See—*
Cousins, Morison S.; Klawson, Rennold L.; and Watson, Roy, 3,700,146.

General Instrument Corporation: *See—*
Keen, Ralph S., Jr., 3,700,508.

General Medical Corporation, mesne: *See—*
Ziermann, Hermann, 3,699,990.

General Motor Corporation: *See—*
Mayeda, Thomas H., 3,700,418.

General Motors Corporation: *See—*
Bayre, Willard W., 3,699,805.
Beehler, Larry A.; and Templin, Jackson R., 3,700,165.
Bellware, James D., 3,699,605.
Bennethum, James E., 3,699,770.
Bennethum, James E., 3,699,929.
Davis, Roger C., 3,700,330.
Delorean, John Z., 3,700,080.
Ditto, Edwin D.; and Stone, William S., 3,699,639.
Donohue, Robert J.; and Joseph, Bernard W., 3,700,883.
Furnival, Thomas J., 3,700,969.
Graddy, Willard E.; and Anderson, Willis H., 3,701,085.
Gutting, James I., 3,700,996.
Jackson, George W.; Long, Paul J., Jr.; and Fannin, Wayne V., 3,700,273.
Pryjmak, Bohdan I., 3,700,988.
Rausch, John T.; and Parker, William J., 3,700,069.
Riess, Joseph A.; and Vespie, Conrad P., 3,701,001.
Wagner, Douglas A., 3,699,850.
Wanlass, Bert R., 3,699,716.
Williamitis, Victor A., 3,700,484.
Wize, Gary A., 3,700,258.

General Motors Corpration: *See—*
Hay, Charles N., 3,700,298.

General Steel Industries, Inc.: *See—*
Gacs, Peter T.; and Shirzad, Paul P., 3,699,600.

General Tire & Rubber Company, The: *See—*
Durst, Richard R.; and Uelzmann, Heinz, 3,700,707.

General Tire & Rubber, The: *See—*
Ford, Bryce W.; Meyer, Daniel A.; and Warner, Walter C., 3,699,808.

Genovese, Eugene R.: *See—*
Chang, Hsu; and Genovese, Eugene R., 3,701,125.

Gentsch, Erich; Bederke, Klaus; Seider, Walter; Fullner, Hans Jurgen; and Muhlmann, Christa, to Herberts, Kurt, Dr., & Co. Process for the production of sheet-form backing materials coated with fused synthetic resins. 3,700,483, Cl. 117-65.200.

Geomet, Incorporated: *See—*
Anderson, Howard H.; Moyer, Rudolph H.; Sibbert, Donald, J.; and Sutherland, David C., 3,700,896.

Gerdts, Gustav F., KG: *See—*
Rudel, Kurt, 3,700,001.

Gerecke, Max; and Zimmermann, Jean Pierre, to Hoffmann-La Roche Inc. ( )-Cis-1,3-dibenzyl-hexahydro-1H-furo[3,4-] imidazole-2,4-dione, processes and intermediates. 3,700,659, Cl. 260-239.500.

Gerin, Merlin: *See—*
Billon, Gerard; Henry, Jean Claude; and Vincent, Eugene, 3,700,848.

Gerlach, John R.; and Morrensen, Clarence B., to Emhart Corporation. Latch construction including assembly, anti-violation and dead bolt features. 3,699,788, Cl. 70-134.000.
Gerling, Ernst Joachim. Pocketknife. 3,699,654, Cl. 30-155.000.
Germer, John H., to United States of America, Atomic Energy Commission. Device to prevent sodium freezing around shaft penetration. 3,700,551, Cl. 176-40.000.
Germer, Walter F., Jr.; Stringer, Carl W.; and Harrison, William H., to Germer-Stringer Corporation. Secondary recovery and well stimulation, solutions, and methods of use. 3,700,031, Cl. 166-270.000.
Germer-Stringer Corporation: *See—*
Germer, Walter F., Jr.; Stringer, Carl W.; and Harrison, William H., 3,700,031.
Geusic, Joseph Edward; Nelson, Terence John; and Schinke, David Paul, to Bell Telephone Laboratories, Incorporated. Ferroelectric domain shifting devices. 3,701,122, Cl. 340-173.200.
Gevaert-Agfa N.V.: *See—*
Brinckman, Eric Maria; Van Den Heuvel, Walter August; Vanhalst, Johan Eugeen; and Heugebaert, Frans Clement, 3,700,452.
Ghyczy, Mikols: *See—*
Asinger, Friedrich; Offermanns, Heribert; and Ghyczy, Mikols, 3,700,683.
Giacopelli, Umberto. Electrolytic cell. 3,700,582, Cl. 204-275.000.
Giamei, Anthony F.; and Terkelsen, Bruce E., to United Aircraft Corporation. Casting of directionally solidified articles. 3,700,023, Cl. 164-60.000.
Giardini, Dante S.; and Chhabra, Indarmohan S., to Bendix Corporation, The. Method and apparatus for internal plunge grinding. 3,699,728, Cl. 51-356.000.
Gibs, Gabriel Joseph: *See—*
Remers, William Alan; Gibs, Gabriel Joseph; and Weiss, Martin Joseph, 3,700,684.
Giebel, Walter C. Recovery of minerals. 3,700,103, Cl. 209-169.000.
Gierschek, Emil: *See—*
Papst, Georg F.; Gierschek, Emil; and Papst, Hans-Dieter, 3,700,358.
Giesecke, Albert S.: *See—*
Cook, Thomas L., 3,700,230.
Gignoux, Dominique: *See—*
Murray, Russell; and Gignoux, Dominique, 3,700,909.
Gilbreath, John: *See—*
Riley, Ray Joe, 3,700,459.
Gillard, Paul O., to Australia, Commonwealth of, care of the Secretary. High density and high frequency digital recording using elongated bits to overcome the effects of tape droupouts. 3,701,134, Cl. 340-174.10g.
Gilmore, Thomas P., to Allis-Chalmers Manufacturing Company. Power factor relay. 3,701,013, Cl. 324-.
Giraud, Francois L., to LTV Aerospace Corporation, mesne. Transporation installation with a plurality stations. 3,699,896, Cl. 104-88.000.
Giraudi, Giorgio, to Grace, W. R., & Co. Apparatus for vacuum welding of plastics envelopes. 3,699,742, Cl. 53-86.000.
Girgis, Mikhail M., to Uniroyal, Ltd. Preparation of thionamides. 3,700,664, Cl. 260-247.100.
Girling Limited: *See—*
Chikuma, Toichi, 3,701,035.
Givaudan Corporation: *See—*
Kappeler, Heinrich; and Wild, Jost, 3,700,717.
Gizeh-Werk G.m.b.H.: *See—*
Saraber, Petrus Gerardus, 3,699,975.
Glass, Alastair Malcolm; and Peterson, George Earl, to Bell Telephone Laboratories, Incorporated. Radiation-resistant $LiNbO_3$ and optical devices utilizing same. 3,700,912, Cl. 307-88.300.
Glass, Marvin, & Associates: *See—*
Glass, Marvin I.; and Terzian, Rouben T., 3,699,710.
Glass, Marvin I.; and Terzian, Rouben T., to Glass, Marvin, & Associates. Doll joint. 3,699,710, Cl. 46-162.000.
Glasser, Leon. Stringed musical instrument. 3,699,836, Cl. 84-291.000.
Glaverbel S.A.: *See—*
Plumat, Emile, 3,700,496.
Glehn, Karl. Devices for connecting pipes together. 3,700,266, Cl. 285-24.000.
Glenn, William H., to United Aircraft Corporation. Adjustable nonlinearly transmissive optical device. 3,700,307, Cl. 350-157.000.
Glick, William L.: *See—*
Bowden, James E.; and Glick, William L., 3,701,079.
Glissendorf, Wilmer E., to Advanced Management Engineering & Research Company. Weight-indicating trailer coupler. 3,700,053, Cl. 177-136.000.
Gocho, Yukisato; and Inokuchi, Takahiro, to Toko Kabushiki Kaisha. FM demodulator circuit using phase-shifting multiplier. 3,701,030, Cl. 329-134.000.
Goetzl, Manlio, to International Telephone and Telegraph Corporation, mesne. Variable capacitor having a solid dielectric between its electrodes. 3,700,983, Cl. 317-245.000.
Goglio, Luigi. Semirigid container. 3,700,018, Cl. 150-.500.
Gollobitz, Gregory N., to Behring Corporation. Vertical assembly apparatus. 3,699,628, Cl. 29-200.00a.
Golownia, Robert F.; and Oswitch, Stanley, to Ferro Corporation. Epoxy-terminated polyimides. 3,700,617, Cl. 260-326.00c.
Gomel, Lorenzo Martinez, to International Standard Electric Corporation. Multipolar connector for telephone sets. 3,701,084, Cl. 339-66.00m.
Gomez, Peter Devera. Arithmetic teaching apparatus. 3,699,667, Cl. 35-9.00b.
Gonzalez, Xavier F., to United States of America, Army. Radiation hardened R-L flip-flop circuit. 3,700,930, Cl. 307-292.000.
Goo, Gee-In: *See—*
Cioccio, Armand; and Goo, Gee-In, 3,699,889.
Goodrich, B. F., Company, The: *See—*
Niemann, Theodore F., 3,700,756.
Spicer, Alvin W.; and Talalay, Anselm, 3,700,365.
Stark, Amos J.; and McGinnis, Herbert E., 3,700,092.
Goodrich, George W.; Colson, William B.; and Matle, Calvin C., to Bendix Corporation, The. Increased sensitivity photocathode structure. 3,700,947, Cl. 313-103.000.
Goodyear Aerospace Corporation: *See—*
Apicella, Anthony M., Jr.; and Surprise, Jon M., 3,701,124.
Goodyear Aircraft Corporation: *See—*
Cook, Richard L., 3,700,534.
Goodyear Tire & Rubber Company, The: *See—*
Cook, Michael W., 3,699,840.
Gopert,Max, to Krauss-Maffei Aktiengesellschaft. Machine-control system. 3,700,994, Cl. 318-579.000.
Gordon, David A.: *See—*
Seltzer, Raymond; and Gordon, David A., 3,700,665.
Gorndt, John H., to Lord Corporation. Rotor system. 3,700,352, Cl. 416-134.000.
Gorsky, Egon: *See—*
Gardel, Robert; and Gorsky, Egon, 3,700,384.
Gott, Hans: *See—*
Ritter, Klaus; Gott, Hans; Ritter, Josef; and Ritter, Gerhard, 3,699,756.
Gourse, Stanley J., to United States of America, Army, mesne. Automatic battery polarizing circuit. 3,700,999, Cl. 320-26.000.
GPE Controls, Inc.: *See—*
Dunkelis, Evald, 3,699,999.
Grabowski, Joseph P., to United States of America, Navy, mesne. Multi-mode, monopulse feed s-stem. 3,701,163, Cl. 343-786.000.
Grace, W. R., & Co.: *See—*
Giraudi, Giorgio, 3,699,742.
Kehr, Clifton L.; and Wszolek, Walter R., 3,700,574.
Reid, Philip L., 3,699,745.
Grace, W. R., & Company: *See—*
Daniels, David A., 3,700,957.
Graddy, Willard E.; and Anderson, Willis H., to General Motors Corporation. Electrical connector assembly. 3,701,085, Cl. 339-92.00m.
Graham, John W.: *See—*
Terry, William M.; Graham, John W.; Sinclair, Albert R.; and Kiel, Othar M., 3,700,032.
Granieri, George John; and Lefkowitz, Edward Herbert, to Tappan Company, The, mesne. Control apparatus for air conditioning and like systems. 3,700,914, Cl. 307-141.000.
Grant, Gerald F.: *See—*
Craig, Robert D.; Evans, Richard O.; and Grant, Gerald F., 3,699,734.
Grauer, Oscar H. pH Sensing apparatus. 3,700,577, Cl. 204-195.00g.
Graulus, Marcel Josef Roger: *See—*
Fader, John H.; Keijzer, Johan H.; and Graulus, Marcel Josef Roger, 3,700,225.
Gravicast Patentverwertungsgesellschaft m.b.H.: *See—*
Tenner, Oskar, 3,700,025.
Gray, Lawrence S., to United States of America, Navy. Reduced time delay auto-correlation signal processor. 3,700,876, Cl. 235-181.000.
Gray, Roy A.: *See—*
Brady, Donnie G.; Zuech, Ernest A.; and Gray, Roy A., 3,700,625.
Greeekes, Johannes Anton: *See—*
Aagaard, Einar Andreas; Greeekes, Johannes Anton; and Van Den Enden, Adrianus Wilhelmus Maria, 3,700,831.
Greenberg, Burton: *See—*
Murgas, Karl M.; Greenberg, Burton; and Clark, Otto A., 3,700,326.
Greenbert, Burton: *See—*
Murgas, Karl M.; and Greenbert, Burton, 3,700,327.
Greenblatt, Herbert: *See—*
Gagliardi, Richard P.; Beans, Allen F.; Eddowes, Alfred M.; and Greenblatt, Herbert, 3,701,153.
Greene, William H., to Bendix Corporation, The. Uniformly illuminated meter indicator. 3,699,915, Cl. 116-129.00l.
Grega, Albert: *See—*
Ference, Richard N.; Grega, Albert; Miller, James A.; Stewart, Ray T.; and Stricker, David M., 3,700,101.
Gregory, Benjamin F., to Trak Microwave Corporation. Four band slot antenna. 3,701,161, Cl. 343-770.000.
Grewing, Klaus; and Hacker, Fritz, to Porsche, Dr.-Ing., H.c.F., K.G., Firma. Profile elements for joining armor plates. 3,699,842, Cl. 89-36.00h.
Grey, Donald M.; and Welker, Jerry W., to Sperry Rand Corporation. Table extension for a bale wagon. 3,700,119, Cl. 214-6.00b.
Grier, John D., to Owens-Illinois, Inc. Electrode configuration for electrophotography. 3,700,436, Cl. 96-1.00r.
Griffey, Donald E., to Motorola, Inc. D-C coupled sync clipping video amplifier. 3,700,796, Cl. 178-7.30r.
Griffin Laboratories Incorporated: *See—*

O'Driscoll, Kenneth F.; and Isen, Allan A., 3,700,761.
Grimm, James J.: *See—*
Dufour, Raymond J.; and Grimm, James J., 3,700,265.
Grogan, Michael. Umbrella holder. 3,700,149, Cl. 224-5.100.
Grosh, James L., to United Aircraft Corporation. Transverse filament reinforcing tape and methods and apparatus for the production thereof. 3,700,527, Cl. 156-426.000.
Gross, Chris: *See—*
United States of America, National Aeronautics & Space Administration, 3,700,897.
Groth, Edward John, Jr., to Motorola, Inc. Acquisition method for multi-transmission position locating or navigating systems. 3,701,018, Cl. 325-58.000.
Groz, Theodor, and: *See—*
Berentzen, Hardo, 3,699,784.
Gruenwald, Bjorn J., to Alpha Press Electronics, Inc. Relay counting circuit. 3,700,973, Cl. 317-140.000.
Grumbach, Alfred T. Mortising device. 3,700,344, Cl. 408-108.000.
Gruppo Lepetit S.p.A.: *See—*
Thiemann, Josef Ernst; and Pagani, Hermes, 3,700,558.
GTE Automatic Electric Laboratories Incorporate: *See—*
Sheahan, Desmond F.; and Callander, George C., 3,699,916.
GTE Laboratories Incorporated: *See—*
Cluett, Ronald D., 3,700,956.
GTE Sylvania Incorporated: *See—*
Arumugham, Rangaswamy, 3,700,787.
Eckenbrecht, Robert Roy, 3,700,795.
Rhee, Dong Woo, 3,700,803.
Guardian Industries Corporation: *See—*
McMaster, Harold A., 3,700,425.
Gudmandsen, Robert: *See—*
Anneberg, Vilhelm; Clemmensen, Ellen; Gudmandsen, Robert; and Scheibel, Axel, 3,700,829.
Gulba, Francis S. Portable seating apparatus. 3,700,278, Cl. 297-191.000.
Gulf & Western Industrial Products, Company: *See—*
Freeland, Edward J., 3,700,991.
Keithley, Harry E.; and Helrigel, Robert A., 3,699,882.
Gutheim, August W., to Carrier Corporation. Mounting bracket assembly for air conditioning systems. 3,700,198, Cl. 248-214.000.
Gutleber, Frank S., to United States of America, Army. Median frequency generator. 3,701,026, Cl. 328-15.000.
Gutting, James I., to General Motors Corporation. Remote throttle control via step motor movement and responsive to vehicle or engine condition. 3,700,996, Cl. 318-696.000.
Guyette, Franklin L.; and Frank, Donald R., to Eastman Kodak Company. Control circuitry for assisting electrostatographic compensation. 3,700,323, Cl. 355-3.000.
Gwillim, David Thomas; and Whiting, Robin Joseph, to Plessey Handel und Investments AG. Incremental drive mechanisms. 3,700,154, Cl. 226-156.000.
Gynn, Gilbert M.: *See—*
Berry, David A.; and Gynn, Gilbert M., 3,700,613.
Haacke, Gottfried C.; and Beegle, Lindley Clair, to American Cyanamid Company. Magnetic recording element. 3,700,499, Cl. 117-235.000.
Haak, Frederik A.: *See—*
Stafsudd, Oscar M.; and Haak, Frederik A., 3,701,046.
Haase, Richard J.; and Roever, William L., to Shell Oil Company. Demand sonobuoy. 3,701,088, Cl. 340-2.000.
Haber Instruments, Inc.: *See—*
Haber, Norman, 3,700,176.
Haber, Norman, to Haber Instruments, Inc. Tiltable grinder-blender. 3,700,176, Cl. 241-27.000.
Haberhauer, Karl; Jutzi, Manfred; and Kiess, Reinhold, to Spiess, C. F., & Sohn. Method of making tube. 3,700,513, Cl. 156-69.000.
Hacker, Fritz: *See—*
Grewing, Klaus; and Hacker, Fritz, 3,699,842.
Hackman, Frank C., to Mueller Co. Pipe clamp with improved gap bridge. 3,700,008, Cl. 138-99.000.
Hadam, Wilhelm, to Stoll, H., and Company. Knitting machines, especially flat machines. 3,699,782, Cl. 66-75.000.
Hadland, Wayne O., to United States of America, National Aeronautics and Space Administration. Two degree inverted flexure. 3,700,291, Cl. 308-2.00a.
Haferl, Peter Eduard, to RCA Corporation. Deflection and pincushion correction circuit. 3,700,958, Cl. 315-24.000.
Haftung: *See—*
Jakobi, Wilhelm, 3,700,219.
Haga, Ichiro; and Tamada, Sieechi, to Iwasaki Tsushinki Kabushiki Kaisha a/k/a Iwatsu Electric Co., Ltd. Analogue-digital converter using an integrator. 3,701,146, Cl. 340-347.0nt.
Hagelbarger, David William, to Bell Telephone Laboratories, Incorporated. Balanced, incomplete, block designs for circuit links interconnecting seitching network stages. 3,701,112, Cl. 340-172.500.
Hager, Clarence H., to Modern Caster Co., Inc. Tire storage rack. 3,700,113, Cl. 211-23.000.
Hagino, Hiroshi: *See—*
Nakayama, Kiyoshi; Tanaka, Haruo; and Hagino, Hiroshi, 3,700,557.
Hagler, Thomas A.; and Heithaus, William C., to United States of America, Army. Impedance matching structure having reduced portions of transmission lines connected to offset stripline center conductors with strip guides connecting said center conductors.3,701,054, Cl. 333-1.100.
Hahn, William C., to Phillips Petroleum Company. Determination of voids to solids ratio in porous materials. 3,699,821, Cl. 73-432.00r.
Haiss, Hermann S.; and Lowe, James U., Jr., to United States of America, Navy. 2-Methyl-5-vinyltetrazole: acrylic ester: acrylic acid polymers. 3,700,636, Cl. 260-80.720.
Hakim, Albert S. Amusement and exercise device. 3,699,704, Cl. 46-32.000.
Halbartschlager, Ingomar; and Heim, Alfred, to Hoffmann-La Roche Inc. Analyzer apparatus. 3,700,089, Cl. 198-1.000.
Hale, Kenneth Calvert; and Scrine, Gerald Robin, to Shipowners Refrigerated Cargo Research Association. Liquid nitrogen refrigeration system. 3,699,694, Cl. 62-158.000.
Hall, Arthur E. Flagg staff anchor. 3,700,196, Cl. 248-44.000.
Hall, Richard E.; and Segar, Lawrence P., to International Business Machines Corporation. Dynamic discrimination reference level generator for a parallel channel optical document scanner. 3,701,099, Cl. 340-146.3ag.
Hamada, Takaki; Nakashio, Seizo; Maruta, Isao; Hayatsu, Kazuo; Seto, Tetsuki; and Kono, Yoichi, to Sumitomo Chemical Company, Limited. Modified polyphenylene oxide and method for production thereof. 3,700,630, Cl. 260-17.250.
Hamamatsu TV Company, Limited: *See—*
Suzuki, Yoshiji; Hayashi, Ikuo; Karasawa, Kazuo; and Shimada, Mitsuhiro, 3,700,953.
Haman Factors Research Incorporated: *See—*
O'Hanlon, James F., Jr.; and Sanderson, Glenn A., 3,699,949.
Hamano, Yoshihiko: *See—*
Hatayama, Takefumi; Hamano, Yoshihiko; and Yamamoto, Tsuyoshi, 3,700,572.
Hamilton Digital Controls, Inc.: *See—*
Zacaroli, Edward C., 3,700,828.
Hamilton, Stephen B.; Beers, Melvin D.; and Berger, Abe, to Selin, Terry G. Curable compositions. 3,700,714, Cl. 260-448.20b.
Hamman, Ingeborg: *See—*
Hoffmann, Hellmut; Hamman, Ingeborg; and Homeyer, Ben.hard, 3,700,687.
Hammann, Ingeborg: *See—*
Fest, Christa; Hammann, Ingeborg; and Behrenz, Wolfgang, 3,700,686.
Hammond Corporation: *See—*
Borrevik, Alexander J.; and Tennes, Charles J., 3,701,040.
Hampel, Viktor E.; Lee, Joseph D., III; and Walter, Carl E., to United States of America, Atomic Energy Commission. Space reactor ground safety and control system. 3,700,554, Cl. 176-86.00m.
Hanafin, Paul M. Blood pressure cuff with calibrated holding means. 3,699,945, Cl. 128-2.05c.
Hanan, John. Air valve safety lock. 3,700,208, Cl. 251-90.000.
Handler, Elliot; Beasley, Noel F.; Garcia, Armando J.; and May, Richard L., to Mattel, Inc. Doll Posing stand. 3,699,712, Cl. 46-116.000.
Hanke, David E., to Kimberly-Clark Corporation. Tubular plastic inserter for tampons. 3,699,962, Cl. 128-263.000.
Hanley, Harold G.; and Williamson, Edward E., to Motorola, Inc. Handle fastening assembly. 3,699,612, Cl. 16-115.000.
Hanlon, Thomas F. Black-and-white image control by ultrasonic modulation of nematic liquid crystals. 3,700,805, Cl. 178-7.30d.
Hans, Stender: *See—*
Blaurock, Gunter; Hans, Stender; and Werner, Will, 3,700,271.
Hanzawa, Teruo: *See—*
Sakamoto, Kenro; Tanaka, Motoaki; Hanzawa, Teruo; and Kasai, Keiji, 3,700,454.
Harby, Bernard, Limited: *See—*
Harby, Bernard M., 3,699,610.
Harby, Bernard M., to Harby, Bernard, Limited. Drapery track assembly. 3,699,610, Cl. 16-94.000.
Harder, Abraham. Chock for a tandem wheeled trailer. 3,700,077, Cl. 188-32.000.
Hardman Incorporated: *See—*
Hardman, Kenneth V.; and Anderson, Alfred J., 3,700,215.
Hardman, Kenneth V.; and Anderson, Alfred J., to Hardman Incorporated. Mixing and dispensing device. 3,700,215, Cl. 259-98.000.
Harkenrider, Robert J.; and Moe, John L., to Way-co, Incorporated. Control circuit. 3,700,933, Cl. 307-310.000.
Harper, David C. Scanning optical system for photocopying apparatus. 3,700,325, Cl. 355-8.000.
Harper, Leonard Roy: *See—*
Finnegan, Edward D.; Harper, Leonard Roy; Mitrofanoff, Nicholas S.; and Slutman, Allen C., 3,701,105.
Harris, Bernard: *See—*
Butzow, Neil W.; and Harris, Bernard, 3,700,295.
Harris, James J.: *See—*
Hulse, George E.; and Harris, James J., 3,700,639.
Harris-Intertype Corporation: *See—*
Henkel, Norman K., 3,699,886.
Southam, Donald L.; and Kacmarcik, Thomas J., 3,699,887.
Harrison, Lee, III; Honey, Francis J.; and Tajchman, Edwin J., to Computer Image Corporation. Computer animation generating system. 3,700,792, Cl. 178-6.800.
Harrison, William H.: *See—*
Germer, Walter F., Jr.; Stringer, Carl W.; and Harrison, William H., 3,700,031.
Hartenstein, Josef, to Henkel & Cie G.m.b.H. Zinc acid bath electroplating. 3,700,570, Cl. 204-55.00r.
Hartline, Ralph E., to Atlantic Richfield Company, mesne. Apparatus. 3,701,005, Cl. 324-.50r.

Hartling, Donald C.: *See—*
Clarke, Charles D.; and Hartling, Donald C., 3,699,705.
Harvey, Lawrence, to BP Chemicals Limited. Method and apparatus for feeding pelleted materials. 3,700,140, Cl. 222-1.000.
Hasbrook, Albert Howard, 50% to Wilcox, Stanley W. Vehicular attitude-control display. 3,701,092, Cl. 340-27.0at.
Haskon Incorporated: *See—*
King, Percy; and Garrett, Howard R., 3,699,743.
Hatakeyama, Shigeyuki: *See—*
Sato, Wasuke; Hatakeyama, Shigeyuki; Koide, Masashi; Yamamoto, Sadao; and Fujisawa, Mitsumaro, 3,700,523.
Hatayama, Takefumi; Hamano, Yoshihiko; and Yamamoto, Tsuyoshi, to Asahi Kasei Kogyo Kabushiki Kaishi. Method of electrolytically reducing aromatic hydrocarbons. 3,700,572, Cl. 204-73.00r.
Haupt, Robert C.: *See—*
Scheinkoenig, Robert J.; and Haupt, Robert C., 3,700,259.
Hauser, Hans Ulrich, to Bucher-Guyer AG Maschinenfabrik. Conditioning machines for agricultural straw or blade material or the like. 3,699,755, Cl. 56-16.400.
Haverdink, Virgil Dean: *See—*
Essex, Duane Arnold; Haverdink, Virgil Dean; and Hill, Donald Allan, 3,700,039.
Hawker Siddeley Dynamics Limited: *See—*
Bodine, Albert G., 3,700,888.
Hay, Charles N., to General Motors Corpration. Adjustable self-aligning bearing mount. 3,700,298, Cl. 308-194.000.
Hayase, Joshua Y.: *See—*
Blasbalg, Herman L.; Hayase, Joshua Y.; Crutchfield, Richard C., Jr.; and Najjar, Hann F., 3,700,820.
Hayashi, Ikuo: *See—*
Suzuki, Yoshiji; Hayashi, Ikuo; Karasawa, Kazuo; and Shimada, Mitsuhiro, 3,700,953.
Hayashi, Kiyohide: *See—*
Adachi, Toshio; Hayashi, Kiyohide; and Okura, Yukio, 3,700,026.
Hayashi, Yoshiaki: *See—*
Tatematsu, Kenzo; Hosono, Hiroo; Katagiri, Toshio; Hayashi, Yoshiaki; and Ando, Hiroyuki, 3,700,818.
Hayatsu, Kazuo: *See—*
Hamada, Takaki; Nakashio, Seizo; Maruta, Isao; Hayatsu, Kazuo; Seto, Tetsuki; and Kono, Yoichi, 3,700,630.
Hayes, John C., to Universal Oil Products Company. Aromatic hydrogenation process. 3,700,742, Cl. 260-667.00r.
Haynes, Harvey H., to United States of America, Navy. Underwater shock-absorbing and deceleration device. 3,699,689, Cl. 61-69.000.
Hazzard, Noel D.: *See—*
Gach, Francis X.; Fanton, Ralph E.; and Hazzard, Noel D., 3,699,905.
Hearns, Harold L.; and Donald, Harold J., to Dow Chemical Company, The. Film size control apparatus. 3,700,370, Cl. 425-140.000.
Heath, Neill Mck. Headband device for sinus relief. 3,699,955, Cl. 128-97.000.
Heck, Richard F., to Hercules Incorporated. Introduction of organic groups into ethylenically unsaturated esters using a group VIII metal salt. 3,700,727, Cl. 260-476.00r.
Hecker, Robert W., Jr.; and Beckwith, Robert C., to Loomis Machine Company. Dockboard assembly. 3,699,601, Cl. 14-71.000.
Heckman, Donald B., to AMF Incorporated. Shipboard acoustic receiver. 3,701,090, Cl. 340-3.00r.
Hedrick, Lloyd C. Air door operator. 3,699,717, Cl. 49-264.000.
Heightley, John Donnell, to Bell Telephone Laboratories, Incorporated. Threshold logic overflow detector. 3,700,874, Cl. 235-164.000.
Heim, Alfred: *See—*
Halbartschlager, Ingomar; and Heim, Alfred, 3,700,089.
Heinrich Koppers Gesellschaft mit beschrankter: *See—*
Jakobi, Wilhelm, 3,700,219.
Heintz, Walter K.; and Unnewehr, Lewis E., to Ford Motor Company. Disc-type variable reluctance rotating machine. 3,700,943, Cl. 310-168.000.
Heintz, Walter K., to Ford Motor Company. Disc-type variable reluctance rotating machine. 3,700,944, Cl. 310-168.000.
Heitfield, Vernon D., to Buffington, William. Toe stop roller skates. 3,700,253, Cl. 280-11.200.
Heithaus, William C.: *See—*
Hagler, Thomas A.; and Heithaus, William C., 3,701,054.
Heiz, Max; and Kalocay, Rudolf, to Sprecher & Schuh A.G. Modular remote control and supervisory system switchgear. 3,701,101, Cl. 340-163.000.
Helke, Robert C.: *See—*
Cornish, Alan H.; Helke, Robert C.; Le Donne, Alex N.; and Masters, Hugh E., 3,700,565.
Hellriegel, Edmund: *See—*
Forsting, Bernard; Hellriegel, Edmund; and Pfadenhauer, Dieter, 3,700,076.
Helm Tractor & Equipment Company: *See—*
Holm, William Z., 3,699,922.
Helmerich & Payne, Inc.: *See—*
Smith, Marvin Glenn, 3,699,735.
Helms, Clifford J.; McMillan, Norman; and Papadopoulos, Stelios B., to Sperry Rand Corporation, mesne. Magnetic disc assembly. 3,700,855, Cl. 219-388.000.
Helrigel, Robert A.: *See—*
Keithley, Harry E.; and Helrigel, Robert A., 3,699,882.
Hempel, Gerhard; Wieske, Reinhold; Krieger, Bernhard; and Kaspar, Emanuel, to Schering A.G. Catalytic preparation of 17α-acyloxy-20-keto-steroids. 3,700,660, Cl. 260-239.550.
Henkel & Cie G.m.b.H.: *See—*
Bloching, Helmut, 3,700,601.
Hartenstein, Josef, 3,700,570.
Nagel, Horstmar; Berg, Markus; Lohr, Albrecht; and Adler, Wilfried, 3,700,600.
Henkel, Norman K., to Harris-Intertype Corporation. Disconnect arrangement for multi-unit printing press. 3,699,886, Cl. 101-183.000.
Henry, Jean Claude: *See—*
Billon, Gerard; Henry, Jean Claude; and Vincent, Eugene, 3,700,848.
Henry Valve Company: *See—*
Jones, Evan, 3,700,206.
Hentrich, Robert Dale; Esbeck, Howard Christian; and Arnold, Loren Glenn, to Deere & Company. Plow colter with yieldable force-applying means and adjustable overload mount for colter carrying arm. 3,700,037, Cl. 172-265.000.
Herbert, Daniel H. Pivotable axle. 3,700,255, Cl. 280-81.00a.
Herberts, Kurt, Dr., & Co.: *See—*
Gentsch, Erich; Bederke, Klaus; Seider, Walter; Fullner, Hans Jurgen; and Muhlmann, Christa, 3,700,483.
Hercules Incorporated: *See—*
Heck, Richard F., 3,700,727.
Keim, Gerald I., 3,700,623.
Herczog, Andrew: *See—*
Asher, John W.; and Herczog, Andrew, 3,699,620.
Herion, Erich; and Ruchser, Erich, to Technomatic AG. Control valve for the flow to and from a variable pressure. 3,699,993, Cl. 137-102.000.
Herleikson, Arne J. Dual purpose transmission line. 3,700,900, Cl. 250-199.000.
Hermanns, Leonard S., to Mech-El Industries, Inc. Apparatus for improving alignment of beam leaded bonding tools. 3,700,155, Cl. 228-3.000.
Hermanns, Leonard S., to Mech-El Industries, Inc. Bonding head for bonding beam leaded devices to a substrate. 3,700,156, Cl. 228-4.000.
Hero, Richard A., to Port-A-Stall. Horse stall construction. 3,699,924, Cl. 119-16.000.
Heroux, J. Omer. End roll protector. 3,700,099, Cl. 206-59.00f.
Hersey-Sparling Meter Company: *See—*
Sparling, Raymond T.; and Dietz, William A., 3,700,007.
Hesphide, William H.: *See—*
United States of America, National Aeronautics and Space Administration, 3,699,799.
Hesse, Holger; deceased (by Hesse, Ruth Lea; heiress and executrix); and Ruben, Henning M. Valve arrangement, especially for use in anaesthetic gas supply systems. 3,700,000, Cl. 137-494.000.
Hesse, Ruth Lea: *See—*
Hesse, Holger; and Ruben, Henning M., 3,700,000.
Hesser, Fr., Maschinenfabrik, A.G.: *See—*
Beck, Otto; and Spalding, Georg, 3,700,854.
Heugebaert, Frans Clement: *See—*
Brinckman, Eric Maria; Van Den Heuvel, Walter August; Vanhalst, Johan Eugeen; and Heugebaert, Frans Clement, 3,700,452.
Hewlett Packard Company: *See—*
Barrett, John C.; Borden, Howard C.; and Loebner, Egon E., 3,701,123.
Hewlett-Packard Company: *See—*
Dukes, John N., 3,701,042.
Kruger, William P., 3,699,997.
Heyman, Philip Michael, to RCA Corporation. Method of improving cathodochromic sensitivity. 3,700,804, Cl. 178-7.50d.
Hickey, Lionel Russell, to Eastman Kodak Company. Magnetically controlled machine programmer. 3,700,906, Cl. 250-208.000.
Hielema, Ralph, to Kendall Company, The. Method of applying corrosion and mechanical protective coatings in form of tapes to a metal pipe. 3,700,520, Cl. 156-162.000.
Higashi, Seiya; and Kobayashi, Kenro, to Kokusai Denki Kabushiki Kaisha. Crystal pulling apparatus having means for maintaining liquid-solid crystal interface at a constant temperature. 3,700,412, Cl. 23-273.0sp.
Higashinakagawa, Iwao: *See—*
Yasuda, Nobuaki; Ogawa, Takenobu; Murakami, Yoshio; Higashinakagawa, Iwao; Takeno, Syozo; and Tanaka, Norio, 3,699,619.
Higgins, Lawrence M. Automatic dump system for contaminants collected in a slurry processing sump. 3,700,102, Cl. 209-158.000.
Higley, Willard S., to United States of America, Interior. Cleaning of used membrane withoxalic acid. 3,700,591, Cl. 210-23.000.
Hill, Donald Allan: *See—*
Essex, Duane Arnold; Haverdink, Virgil Dean; and Hill, Donald Allan, 3,700,039.
Hill, Marion E.: *See—*
Coon, Clifford L.; Hill, Marion E.; and Ross, Donald L., 3,700,723.
Hillson, Peter John; and Ridgway, Michael, to Eastman Kodak Company. Disproportionating imagewise distribution of metallic nuclei to form visible metallic image. 3,700,448, Cl. 96-48.00r.
Hinds, Walter E.: *See—*

Tarbox, John W.; Hinds, Walter E.; and Castro, Rodolfo, 3,699,630.
Hinkley, David F., to Merck & Co., Inc. 2-Carboxy or 2-carboxylower alkyl derivatives of 5-fluoro-1-(p-methylsulfinyl-benzylidene)-indenyl-3-acetic acid. 3,700,730, Cl. 260-515.00a.
Hirooka, Masaaki: *See*—
Nakaguchi, Kohei; Kawasumi, Shohachi; Hirooka, Masaaki; and Yabuuchi, Hiroshi, 3,700,647.
Hirooka, Masaaki; Yasui, Seimei; Mashita, Kentaro; and Kimura, Fumiyuki, to Sumitomo Chemical Company, Ltd. Method for producing alternating copolymers. 3,700,648, Cl. 260-63.00r.
Hirose, Tatsuo: *See*—
Abe, Isao; Hirose, Tatsuo; and Ohshima, Kotaro, 3,699,976.
Hiruta, Shiro: *See*—
Ishikawa, Tatsuo; Hiruta, Shiro; Wakabayashi, Teruomi; Inamoto, Yoshihiko; Tetsuhiro, Kusunose; Isumaki, Tatsuichi; and Ota, Masami, 3,700,662.
Hitachi, Ltd.: *See*—
Masuhara, Toshiaki; Nagata, Minoru; and Kubo, Masaharu, 3,700,981.
Hittel, William C.; and Sachs, Charles M., to International Playtex Corporation. Foundation garment. 3,699,971, Cl. 128-491.000.
Hiyosi, Hirosi; and Kanda, Masao, to Fuji Photo Film Co., Ltd. Method of coating by delaying the control signal for operating the coating apparatus. 3,700,490, Cl. 117-120.000.
Hobbs, Alfred J.: *See*—
Seidenberg, Benjamin; and Hobbs, Alfred J., 3,700,893.
Hodges Chemicals Company: *See*—
Schmitz, Robert D., 3,700,533.
Hoelscher, Max W.: *See*—
Novajovsky, William A.; and Hoelscher, Max W., 3,701,061.
Hoer, Cletus A., to United States of America, Navy. Broad-band lumped-element directional coupler. 3,701,057, Cl. 333-10.000.
Hofer, Gerald: *See*—
Eckert, Konrad; Eheim, Franz; Hofer, Gerald; and Koster, Claus, 3,699,939.
Hoff, Dale R.; and Rooney, Clarence S., to Merck & Co., Inc. Nitroimidazole derivatives. 3,700,685, Cl. 260-309.000.
Hoff, Gunter; and Langbein, Gerhard, to Dornier Systems G.m.b.H. Satellite. 3,700,488, Cl. 117-94.000.
Hoffee, Joseph M. Fluid sensing cutter control. 3,699,908, Cl. 112-130.000.
Hoffmann, Hellmut; Hamman, Ingeborg; and Homeyer, Bernhard, to Farbenfabriken Bayer Aktiengesellschaft. (Thiono) phosphoric (phosphonic)-acid esters. 3,700,687, Cl. 260-310.00r.
Hoffmann-La Roche Inc.: *See*—
Beaman, Alden Gamaliel; Duschinsky, Robert; and Tautz, William Paul, 3,700,698.
Furst, Andor; Muller, Marcel; Muller, Peter; Schocher, Arne Johannes; and Bacher, Elisabeth, 3,700,702.
Gasche, Urs; Lindlar, Herbert; Rutishauser, Max; and Steiner, Riedholz Kurt, 3,700,501.
Gerecke, Max; and Zimmermann, Jean Pierre, 3,700,659.
Halbartschlager, Ingomar; and Heim, Alfred, 3,700,089.
Leimgruber, Willy; and Weigele, Manfred, 3,700,679.
Lerner, Irwin; and McGrath, Robert Paul, 3,700,774.
Saucy, Gabriel; and Scott, John William, 3,700,661.
Hofmeister, John M. Connecting device for articles of clothing. 3,699,617, Cl. 24-81.0gs.
Hogg, Walter R., to Coulter Electronics, Inc. Axial trajectory sensor for electronic particle study apparatus and method. 3,700,867, Cl. 235-151.300.
Hogg, Walter R., to Coulter Electronics, Inc. Axial trajectory sensor having grating means controlled by pulse duration measuring. 3,701,029, Cl. 328-91.000.
Holbrook, Legrand K., to Medical Development Corporation. Body fluid collection bottle. 3,699,815, Cl. 73-427.000.
Holdread, Robert N. Spare wheel carrier. 3,700,130, Cl. 214-454.000.
Hollenton, Frank, to AMF Incorporated. Tobacco leaf conditioner. 3,699,977, Cl. 131-147.00r.
Holly, James A., to Permalok International, Inc. Wig. 3,699,978, Cl. 132-53.000.
Holly Sugar Corporation: *See*—
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Holm, William Z., to Helm Tractor & Equipment Company. Automatic milking barn. 3,699,922, Cl. 119-14.030.
Holmes, Ervine Stout: *See*—
Symoniak, Martin Francis; Torke, David Allen; and Holmes, Ervine Stout, 3,700,589.
Holmes, Richard N.: *See*—
Dobbs, Richard A.; and Holmes, Richard N., 3,700,067.
Holsinger, Jerry L., to Intertel, Inc. Active filter. 3,701,037, Cl. 330-107.000.
Holstein & Kappert Maschinenfabrik Phonix GmbH: *See*—
Knabe, Uwe, 3,699,740.
Holy, Vladislav, to Vyzkumny ustav Kovu. Cyclone kiln system. 3,700,221, Cl. 266-9.000.
Homeyer, Bernhard: *See*—
Hoffmann, Hellmut; Hamman, Ingeborg; and Homeyer, Bernhard, 3,700,687.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Honeywell Inc.: *See*—
Bergin, William P., 3,701,145.
Fulkerson, David E., 3,700,924.
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Honeywell Information Systems Inc.: *See*—
Howell, Thomas H., 3,700,870.
Howell, Thomas H., 3,701,094.
Reichhard, Robert W., 3,701,126.
Honig, Helmut: *See*—
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Honshu Paper Company: *See*—
Ohmori, Koichiro, 3,700,518.
Hood, Jesse C., Jr.; and Palmer, Harold D. Electrical component insertion-removal tool. 3,699,629, Cl. 29-203.00h.
Hooker Chemical Corporation: *See*—
Carr, Russell L. K.; and Baranauckas, Charles F., 3,700,695.
Hoover Company, The: *See*—
Clausse, Georges Jean Louis-Marie, 3,701,063.
Hoppin, George S., III; Yount, Reed E.; Berry, Thomas F.; and Barker, James F., to General Electric Company. Powder for diffusion bonding of superalloy members. 3,700,427, Cl. 75-.50r.
Horizons Inc.: *See*—
Reynard, Kennard A.; and Rose, Swlwyn K., 3,700,629.
Horr, William A.: *See*—
Piatek, Edward Walter; and Horr, William A., 3,699,828.
Hortnagl, Franz, to Daimler-Benz Aktiengesellschaft. Elastic mounting of a radiator of motor vehicle. 3,700,061, Cl. 180-68.00r.
Horvitz, Leo. Method of geochemical prospecting. 3,700,407, Cl. 23-230.0ep.
Hosono, Hiroo: *See*—
Tatematsu, Kenzo; Hosono, Hiroo; Katagiri, Toshio; Hayashi, Yoshiaki; and Ando, Hiroyuki, 3,700,818.
Hoss, Robert J., to Zinsco Electrical Products. Ground fault detector circuit. 3,700,967, Cl. 317-18.00d.
Hostetler, William: *See*—
Brey, Wilhelm; Hostetler, William; Loeffler, Earl Ferdnand; Kolm, Hubert Ernest; and Elder, Fred Grove, 3,700,526.
Hotta, Takeshi; and Ishikawa, Hisashige. Condenser leakage monitoring system. 3,699,802, Cl. 73-40.50r.
Houbolt, Jacob J.H.C.: *See*—
Bezemer, Cornelis; Tadema, Harco J.; and Houbolt, Jacob J.H.C., 3,700,593.
Hovermarine (Canada) Limited: *See*—
Richardson, Harold; and Newman, Bruce D., 3,700,064.
Howard, David Campbell, to Gas Council, The. Leak clamp assemblies. 3,700,270, Cl. 285-337.000.
Howard, Harold K., to United States of America, Navy. Bipolar sample and hold circuit. 3,701,152, Cl. 343-16.00m.
Howe, Hans-Ulrich, to Klockner-Humboldt-Deutz Aktiengesellschaft. Cylinder head connection for reciprocable piston internal. 3,699,852, Cl. 92-169.000.
Howell, Thomas G.: *See*—
Corsmeier, Robert J.; Howell, Thomas G.; Corrigan, Charles E.; and Koff, Bernard L., 3,700,348.
Howell, Thomas H., to Honeywell Information Systems Inc. Error control arrangement for associative information storage and retrieval. 3,700,870, Cl. 235-153.000.
Howell, Thomas H., to Honeywell Information Systems Inc. Error control arrangement for information comparison. 3,701,094, Cl. 340-146.1al.
Hubbard, Ronald R.; and Nalevanko, Richard N., to Anaconda Wire and Cable Company. Dispensable coil package. 3,700,185, Cl. 242-159.000.
Huddle, Carl F., to Tension Structures Co. Housing with cable suspended panels. 3,699,987, Cl. 135-4.00r.
Huff, Ronald G., to United States of America, National Aeronautics and Space Administration. Method of making apparatus for sensing temperature. 3,699,645, Cl. 29-573.000.
Hughes Aircraft Company: *See*—
Dahlinger, Rodney J.; and Farnsworth, Robert P., 3,700,913.
Myer, Jon H.; O'Mera, Thomas R.; and Richardson, John M., 3,700,907.
Seaton, Arthur F., 3,701,162.
Stafsudd, Oscar M.; and Haak, Frederik A., 3,701,046.
Tarbox, John W.; Hinds, Walter E.; and Castro, Rodolfo, 3,699,630.
Hughes, Ronald William; and Boyse, Alan, to Lucas, Joseph, (Industries) Limited. Fuel control apparatus. 3,699,941, Cl. 123-179.00g.
Hughes Tool Company: *See*—
Galle, Edward N., 3,699,675.
Hullett, David F.: *See*—
Lytton, Kenneth G.; Hullett, David F.; and Miller, George J., 3,700,091.
Hulse, George E.; and Harris, James J., to Sinclair-Koppers Company. Crystalline polystyrene products. 3,700,639, Cl. 260-88.20c.
Hulsman, William H., to Control Design, Inc. Transistorized thermocouple flame detector. 3,701,137, Cl. 340-228.00r.

Humphrey, Burnice Lee. Sump pump cover. 3,699,730, Cl. 52-19.000.
Humphrey, William G., Jr.; and Rishton, Michael L., to Dyonics Inc. Flexible optical light pipes used for surgery. 3,699,950, Cl. 128-23.000.
Hunt, Charles J., to Vulcan Corporation. Butchers' bone dust scraper. 3,699,604, Cl. 15-236.00r.
Hunter, Paul Douglas; and Machol, Richard Erving, Jr., to Bell Telephone Laboratories, Incorporated. Detection of errors in shift register sequences. 3,701,096, Cl. 340-146.10d.
Hurlburt, Joseph C., to Sperry Rand Corporation. Belt carried cutters and mounting means therefor. 3,699,757, Cl. 56-291.000.
Hurlburt, Joseph C., to Sperry Rand Corporation. Tiltable steering system. 3,700,257, Cl. 280-87.00a.
Husky Manufacturing and Tool Works Ltd.: *See—*
Rees, Herbert, 3,700,375.
Hutchinson, Francis Gowland, to Imperial Chemical Industries Limited. Gel polymerized polyurethane precursors and vinyl monomers. 3,700,752, Cl. 260-859.00r.
Hutchinson, Thomas R.: *See—*
Bennett, Leonard W.; Hutchinson, Thomas R.; and Schilling, Winston H., 3,701,016.
Hutchison, Stanley O., to Chevron Research Company. Method for well cleanout. 3,700,034, Cl. 166-312.000.
Hutner, Mark A.; Polit, Neil A.; Watson, Donald W; and Artelt, Herbert C., Jr., to Xerox Corporation. Electrophotographic printing systems. 3,700,324, Cl. 355-6.000.
Hy-Torq Corporation: *See—*
Schwab, Delmar G., 3,700,082.
Hyde, James A., to Nalco Chemical Company. Silicone oil antifoam. 3,700,587, Cl. 208-131.000.
Hydrocarbon Research, Inc.: *See—*
Johanson, Edwin S.; Wolk, Ronald H.; and Johnson, Clarence A., 3,700,584.
Hydronautics-Israel Ltd.: *See—*
Bloch, Rene A.; Furmansky, Mordechay; and Gassner, Saul, 3,700,576.
Hyndman, Harry L., to Monsanto Company. Insecticidal composition containing trifluoromethyl substituted benzanilides and method of using the same. 3,700,778, Cl. 424-324.000.
ICP, Inc.: *See—*
Murgas, Karl M.; Greenberg, Burton; and Clark, Otto A., 3,700,326.
Murgas, Karl M.; and Greenbert, Burton, 3,700,327.
Identicon Corporation: *See—*
Wolff, Gerald, 3,701,097.
Ifield, Richard Joseph, to Lucas, Joseph, (Industries) Limited. Rotary hydraulic pumps and motors. 3,699,845, Cl. 91-6.500.
Igi, Keishiro: *See—*
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ILC Industries, Inc.: *See—*
Durney, George P., 3,699,589.
Illinois Tool Works, Inc.: *See—*
Collier, Frank J., 3,700,135.
Deasy, Raymond E., 3,700,275.
Klygis, Mindaugas Julius, 3,700,276.
Lanius, James Curtis, Jr., 3,699,841.
Imperial Chemical Industrial: *See—*
Tregear, Geoffrey W.; Battaerd, Hendrik A. J.; Lang, Gunter A.; Catt, Kevin; and Niall, Hugh D., 3,700,609.
Imperial Chemical Industries Limited: *See—*
Atherton, John Heathcote; and Plumb, John Beckett, 3,700,713.
Buteux, Richard Harold Barclay, 3,700,540.
Clarke, Kenneth; and Bevan, Ronald, 3,699,621.
Cuthertson, William Wilson, 3,700,400.
Dodman, David,; Pearson, Kenneth William; and Woolley, John Mathers, 3,700,605.
Hutchinson, Francis Gowland, 3,700,752.
Richardson, Dora Nellie; Walpole, Arthur Leonard; and Paget, George Edward, 3,700,777.
Improved Machinery, Inc.: *See—*
Rich, John Parker; and Carlsmith, Lawrence Allan, 3,700,548.
Inamoto, Yoshihiko: *See—*
Ishikawa, Tatsuo; Hiruta, Shiro; Wakabayashi, Teruomi; Inamoto, Yoshihiko; Tetsuhiro, Kusunose; Isumaki, Tatsuichi; and Ota, Masami, 3,700,662.
Indiana University Foundation: *See—*
Muhler, Joseph C.; and Stookey, George K., 3,699,979.
Industrial Science & Technology, Agency of: *See—*
Kuwahara, Ayako, 3,700,058.
Industrie Pirelli Societa per Azioni: *See—*
Ferrentino, Antonio, 3,701,060.
Ingenious Devices Limited: *See—*
Parry, John, 3,700,343.
Ingrey, Sidney Ivor Joseph, to Northern Electric Company Limited. Information on a layer of orthoferrite with an electron beam. 3,701,115, Cl. 340-173.0cr.
Inman, Eric Richard; Macpherson, Ian Alexander; and Stirling, John Andrew, to Ciba-Geigy AG. Azomethine pigments. 3,700,709, Cl. 260-438.100.
Inokuchi, Takahiro: *See—*
Gocho, Yukisato; and Inokuchi, Takahiro, 3,701,030.
Institut Francais du Petrole, des Carburants et Lubrifiants: *See—*
Tiraspolsky, Wladimir; Rouviere, Roger; and Willm, Yves, 3,700,049.
Intel Corporation: *See—*
Vadasz, Leslie L., 3,699,646.
Intercole Automation, Inc.: *See—*
Matsuoka, James T.; and Cantarutti, Armindo, 3,700,374.
International Business Machine Corporation: *See—*
Cocke, John; Mommens, Jacques H.; and Raviv, Josef, 3,701,111.
International Business Machines Corporation: *See—*
Blasbalg, Herman L.; Hayase, Joshua Y.; Crutchfield, Richard C., Jr.; and Najjar, Hann F., 3,700,820.
Chang, Hsu; and Genovese, Eugene R., 3,701,125.
Cheney, Raymond E., 3,700,150.
Davidge, Ronald V.; Locklar, Henry C.; Ralston, James C.; and Ritchie, Robert T., 3,700,328.
Fang, Yang, 3,701,023.
Finnegan, Edward D.; Harper, Leonard Roy; Mitrofanoff, Nicholas S.; and Slutman, Allen C., 3,701,105.
Frei, Armin H., 3,701,148.
Furman, Anatol, 3,700,922.
Hall, Richard E.; and Segar, Lawrence P., 3,701,099.
Kanazawa, Kay Keiji; Seiki, Hajime; and Street, George Bryan, 3,700,498.
Lang, Paul C.; La Pine, Anthony N.; and Vaughn, Julian E., 3,701,039.
Laurer, George J.; and Skatrud, Ralph O., 3,700,859.
Loh, Louis S.; Monnens, Jacques H.; and Raviv, Josef, 3,701,108.
May, Frederick T., 3,700,872.
Yhap, Ernesto F., 3,700,873.
International Computer Limited: *See—*
Taplin, Stanley Donovan; and Pettitt, Malcolm Jack, 3,700,825.
International Harvester Company: *See—*
Asmus, Rodger W., 3,699,677.
Bardos, John J.; and Poplawski, Joel J., 3,699,679.
Boram, William R.; and Acle, Luis, Jr., 3,700,649.
Porter, Robert B.; Ardelt, Clarence A.; and Storck, Robert C., 3,700,081.
Scarnato, Thomas J.; Peacock, Peter J.; and Kowalik, John J., 3,699,758.
Swanson, William C.; Moyer, Donald W.; and Asmus, Rodger W., 3,699,678.
International Machinery Corporation, S.A.: *See—*
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International Minerals and Chemical Corporations: *See—*
Lang, William J., 3,700,474.
International Paper Company: *See—*
Violette, Glenn M.; Paquin, Leon J.; and Lock, James A., 3,700,525.
International Playtex Corporation: *See—*
Dostal, Zdenek Denny, 3,699,965.
Hittel, William C.; and Sachs, Charles M., 3,699,971.
International Rectifier Corporation: *See—*
Weinstein, Harold, 3,700,982.
International Standard Corporation: *See—*
Beguin, Daniel Edmond, 3,701,160.
International Standard Electric Corporation: *See—*
Gomel, Lorenzo Martinez, 3,701,084.
International Telephone and Telegraph Corporation: *See—*
Adams, Henry G., 3,701,155.
Anhalt, John William, 3,699,632.
Garcia, Julian; and Carroll, James C., 3,700,817.
Somerset, Sherman J., 3,701,086.
International Telephone and Telegraph Corporation, mesne: *See—*
Goetzl, Manlio, 3,700,983.
Intertel, Inc.: *See—*
Holsinger, Jerry L., 3,701,037.
Inukai, Noriyoshi: *See—*
Murakami, Masuo; Inukai, Noriyoshi; Koda, Akio; and Nakano, Koji, 3,700,719.
Ionics, Incorporated: *See—*
Swain, Charles Gardner, 3,700,934.
Iota Engineering, Inc.: *See—*
Pulliam, Joseph H.; and McCurnin, Thomas W., 3,701,138.
Irish, Carleton D., to Bell Telephone Laboratories, Incorporated. Intercept connector having two diode mounting holes separated by a diode supporting recess. 3,701,076, Cl. 339-17.00c.
Irvin, Albert H., to Philco-Ford Corporation. Air flow control apparatus. 3,699,873, Cl. 98-116.000.
Isaac, George L.; Kingsbury, Richard F.; and Surak, John G., to Signetics Corporation. Apparatus for testing circuit packages. 3,701,021, Cl. 324-158.00f.
Isen, Allan A.: *See—*
O'Driscoll, Kenneth F.; and Isen, Allan A., 3,700,761.
Ishikawa, Hidehiko: *See—*
Soma, Nobuo; Watatani, Mitsuo; Nakazawa, Junichi; Sato, Yoshio; Kuwabara, Yoshimi; and Ishikawa, Hidehiko, 3,700,682.
Ishikawa, Hidehiko; Sato, Mikio; and Takada, Syun, to Konishiraku Photo Industry Co., Ltd. Color photograph containing fade-preventing agents. 3,700,455, Cl. 96-100.000.
Ishikawa, Hisashige: *See—*
Hotta, Takeshi; and Ishikawa, Hisashige, 3,699,802.
Ishikawa, Tatsuo; Hiruta, Shiro; Wakabayashi, Teruomi; Inamoto, Yoshihiko; Tetsuhiro, Kusunose; Isumaki, Tatsuichi; and Ota, Masami. Triazine derivatives and compositions thereof. 3,700,662, Cl. 260-242.

Ishikawa, Teruo; Kawashima, Koji; and Togashi, Tetuo, to Tokyo Shibaura Electric Co., Ltd. High frequency heating apparatus. 3,700,846, Cl. 219-10.550.
Ishizawa, Masami: *See*—
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Isono, Kiyoshi: *See*—
Suzuki, Saburo; Isono, Kiyoshi; Nagatsu, Junsaku; Akashiba, Takeo; and Sasaki, Shigeki, 3,700,655.
Isumaki, Tatsuichi: *See*—
Ishikawa, Tatsuo; Hiruta, Shiro; Wakabayashi, Teruomi; Inamoto, Yoshihiko; Tetsuhiro, Kusunose; Isumaki, Tatsuichi; and Ota, Masami, 3,700,662.
Isumi, Ichizo. Method for manufacturing gill faller of a constant thickness faller body type. 3,699,643, Cl. 29-527.100.
Itek Corporation: *See*—
Beasley, George A., 3,699,721.
Buchan, William R., 3,700,902.
Eastler, William E., Jr., 3,700,437.
Kruse, Jurgen M.; and Wyman, John E., 3,700,495.
Lerner, Harry, 3,700,449.
McLeod, Gerald L.; French, Hollis E.; Case,Laura K.; Berman, Eliot; and Casella, Joseph, 3,700,440.
Ravich, Leonard E.; Berman, Elliot; and Ekman, Carl F. W. (said Ravich and said Ekman assor. to), 3,700,447.
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ITT Industries, Inc.: *See*—
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Ivanov, Mark Efremovich: *See*—
Vagin, Alexei Alexeevich; Yablonsky, Stanislav Valerievich; Voloshin, Petr Stepanovich; Sharov, Nikolai Grigorievich; Shiborin, Viktor Ivanovich; Novakovsky, Vladimir Efimovich; Kolpakov, Grigory Vasilievich; Ivanov, Mark Efremovich; Lindin, Viktor Mikhailvich; and Lipsky, Daniil Yakovlevich, 3,700,364.
Iwabuchi, Osamu: *See*—
Shimauchi, Shiro; Kitamura, Yuko; Iwabuchi, Osamu; and Matsui, Takeshi, 3,700,399.
Iwai, Issei; Kishida, Yukichi; and Iwashige, Tadahiro, to Sankyo Company, Limited. Arylsulfonylpyrazole compounds. 3,700,688, Cl. 260-310.00r.
Iwasaki Tsushinki Kabushiki Kaisha (a/k/a Iwatsu Electric Co., Ltd.): *See*—
Ozawa, Syuichi; and Tomimura, Noboru, 3,701,056.
Iwasaki Tsushinki Kabushiki Kaisha a/k/a Iwatsu Electric Co., Ltd.: *See*—
Haga, Ichiro; and Tamada, Sieechi, 3,701,146.
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Iwashige, Tadahiro: *See*—
Iwai, Issei; Kishida, Yukichi; and Iwashige, Tadahiro, 3,700,688.
Jackson, Charles L., to Signatron, Inc. Alarm system using coded signalling. 3,701,019, Cl. 325-64.000.
Jackson, George W.; Long, Paul J., Jr.; and Fannin, Wayne V., to General Motors Corporation. Energy absorbing bumper system. 3,700,273, Cl. 293-70.000.
Jackson, Jesse, Jr.: *See*—
MacMillan, Robert T; and Jackson, Jesse, Jr., 3,700,766.
Jacky, Germaine F.; and Ehrlich, Richard D., to United States of America, Atomic Energy Commission. Uranium surface preparation for electroless nickel plating. 3,700,482, Cl. 117-50.000.
Jacobs, Louis L. Fish hook setters. 3,699,701, Cl. 43-15.000.
Jacuone, Roberto: *See*—
Siclari, Francesco; Rossi, Pietro Paolo; Calgari, Seba; and Jacuone, Roberto, 3,700,631.
Jakob, Horst, to Societe Financiere Franciase de Licences et Breveta. Row of fastener elements for a slide. 3,699,618, Cl. 24-205.10c.
Jakobi, Wilhelm, to Heinrich Koppers Gesellschaft mit beschrankter and Haftung. Apparatus for controlling the flow of gas between flues in the heating chambers of a regenerative coke oven. 3,700,219, Cl. 263-15.00r.
Janicek, Mark A. Aquarium platform. 3,699,921, Cl. 119-5.
Janisch, Ingo; and Fleissner, Heinz, to Vepa A.G. Process and apparatus for the wet treatment of expanded textile material lengths. 3,700,404, Cl. 88-158.000.
Janssen, Gail E.; and Wildenberg, Henry N., to Badger Northland, Inc. Collapsible liner for silo chute. 3,699,732, Cl. 52-195.000.
Japan Aircraft Manufacturing Company Limited: *See*—
Takahashi, Senji, 3,699,810.
Japan Monopoly Corporation, The: *See*—
Abe, Isao; Hirose, Tatsuo; and Ohshima, Kotaro, 3,699,976.
Jarnagin, Max L.: *See*—
Sosalla, Harry; Meusburger, Lyle M.; and Jarnagin, Max L., 3,700,040.
Jayne, Max L.; and Williams, Charles A., to Sylvania Electric Products Inc. Fluorescent lamp holder assembly. 3,701,081, Cl. 339-53.000.
Jennings, Brian Michael; and Ager, Johnwalter Albert, to Costain Concrete Company, Limited. Rail fastening assemblies for railroad tracks. 3,700,167, Cl. 238-349.000.
Jennings, Walter B., Jr., to United States of America, Army. Multi-rod single pump source laser. 3,701,048, Cl. 331-94.500.
Jensen, Arne, to Danfoss A/S. Control system for an alternating current motor. 3,700,989, Cl. 318-227.000.
Jensen, Borge: *See*—
Jensen, Jorgen Bent; Jensen, Borge; Krohn, Rasmus; and Keldmann, Erik, 3,700,853.
Jensen, Einar W., to Eastman Kodak Company. Film processing apparatus for processing films of different type. 3,699,869, Cl. 95-94.00r.
Jensen, Jorgen Bent; Jensen, Borge; Krohn, Rasmus; and Keldmann, Erik, to Bristol-Myers Company. Apparatus for heating of hairwinders. 3,700,853, Cl. 219-222.000.
Jeserich, Wolfgang-Dieter: *See*—
Steinhofer, Adolf; Doerfel, Helmut; Falkenstein, Georg; and Jeserich, Wolfgang-Dieter, 3,700,658.
Johannsmeier, Karl-Heinz. Wafer loading apparatus. 3,700,567, Cl. 29-203.00r.
Johanson, Edwin S.; Wolk, Ronald H.; and Johnson, Clarence A., to Hydrocarbon Research, Inc. Hydrogenation of low rank coal. 3,700,584, Cl. 208-10.000.
John, Willibald; Schmalfeld, Paul; Lange, Paul; and Rammler, Roland, to Metallgesellschaft Aktiengesellschaft. Continuous process of producing shaped metallurgical coke. 3,700,564, Cl. 201-6.000.
Johnsen, Eric C., to Gem Products, Inc. Motor protector. 3,701,068, Cl. 337-102.000.
Johnson, Bennie R. Casket handle retained by spreadable webs. 3,699,611, Cl. 16-114.000.
Johnson, Clarence A.: *See*—
Johanson, Edwin S.; Wolk, Ronald H.; and Johnson, Clarence A., 3,700,584.
Johnson, James L.; Schora, Frank C., Jr.; and Tarm, Paul B., to Consolidation Coal Company. Apparatus for conducting a continuous steam-iron process. 3,700,421, Cl. 48-73.000.
Johnson, James L.; Schora, Frank C., Jr.; and Tarman, Paul B., to Consolidation Coal Company. Continuous steam-iron process for making fuel gas. 3,700,422, Cl. 48-197.00r.
Johnson, Joseph A., to Jomar Industries, Inc. Stripper for blow molding machine. 3,700,369, Cl. 425-139.000.
Johnson, Kenneth; and Lense, Robert F., to Rexham Corporation, mesne. Packaging machine for forming and filling bags of different lengths and widths. 3,700,388, Cl. 53-183.000.
Johnson, Kenneth V.; and Miller, David A., to Koehring Company. Vehicle with variable width ground supports. 3,700,115, Cl. 212-38.000.
Johnson, Richard Bruce; and Winn, George, to Rosen, Jacob J. Doll having a substantially seamless foamed integral torso and neck portion. 3,699,714, Cl. 46-156.000.
Johnson, Robert Henry, to Motorola, Inc. Dual mode wave energy transducer device. 3,701,158, Cl. 343-725.000.
Johnson, Sam H., Jr.; and Wright, Howard N., Jr., to Eastman Kodak Company. Process for the manufacture of glycol ether acetates. 3,700,726, Cl. 260-491.000.
Johnson, Sam H., Jr.; Mears, Robert A.; and Park, Vernon K., to Eastman Kodak Company. Hot melt adjesive compositions comprising polyolefin and DAC-B resin. 3,700,758, Cl. 260-897.00r.
Johnson Service Company: *See*—
Munch, Otto R., 3,699,991.
Jomar Industries, Inc.: *See*—
Johnson, Joseph A., 3,700,369.
Jones and Laughlin Steel Corporation: *See*—
Rubin, Robert G., 3,700,485.
Jones, David P. Typewriter for use with a drafting straight edge. 3,700,086, Cl. 197-2.000.
Jones, Elborn W., Jr., to Allis-Chalmers Corporation. Front end suspension. 3,700,256, Cl. 280-87.00r.
Jones, Evan, to Henry Valve Company. Valve assembly. 3,700,206, Cl. 251-84.000.
Jones, John Ivor Parry, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defense in her Britannic Majesty's Government of the. Anemometer rotors. 3,699,801, Cl. 73-189.000.
Jonsson, Karl-Erik Arnold, to Brundell och Johsson AB. Wire race ball bearing. 3,700,845, Cl. 308-216.000.
Jordan, Eugene Leon: *See*—
Epifano, Robert Nicholas; and Jordan, Eugene Leon, 3,700,497.
Joseph, Bernard W.: *See*—
Donohue, Robert J.; and Joseph, Bernard W., 3,700,883.
Jouin, Alfred, to Societe a Responsabilite Limitee: Forges & Trefileries de Conflandey. Processing machine for the production of small coils of metal or otherwise. 3,699,627, Cl. 29-200.00b.
Jung, Karl-Heinz; and Gartner, Klaus-Gunther, to Dynamit Nobel Aktiengesellschaft. Production of stable urea, formaldehyde, polyamine condensation products. 3,700,641, Cl. 260-70.00r.
Jutzi, Manfred: *See*—
Haberhauer, Karl; Jutzi, Manfred; and Kiess, Reinhold, 3,700,513.
JWI Ltd.: *See*—
MacBean, Donald George, 3,700,194.
K-Tech, Inc.: *See*—
Kelly, Cornelius J., Jr., 3,701,077.
Kabushiki Kaisha Hattori Tokeiten: *See*—
Kitai, Kiyoshi, 3,699,866.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Obayashi, Nobuharu, 3,700,781.
Kabushiki Kaisha Ricoh: *See*—
von Grabe, Walther, 3,699,920.
Kabushikikaisha Tokyo Keiki Seizosho Tokyo Keiki Seizosho Co., Ltd.: *See*—
Kawada, Shin-Ichi, 3,699,657.
Kachman, Robert D.: *See*—
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Kacmarcik, Thomas J.: *See*—
Southam, Donald L.; and Kacmarcik, Thomas J., 3,699,887.

Kahng, Dawon, to Bell Telephone Laboratories, Incorporated. Charge coupled devices. 3,700,932, Cl. 307-304.000.

Kaiser, Robert, to Avco Corporation. Ferrofluid composition. 3,700,595, Cl. 252-62.560.

Kajita, Hiroyuki: *See*—
Noda, Masajiro; Kajita, Hiroyuki; and Kuwayama, Koji, 3,700,402.

Kalinsky, Harry. Wrist band and buckle therefor. 3,699,616, Cl. 24-71.00j.

Kalium Chemicals Limited: *See*—
Schad, Charles A., 3,701,007.

Kalocay, Rudolf: *See*—
Heiz, Max; and Kalocay, Rudolf, 3,701,101.

Kaminsky, Manfred S., to United States of America, Atomic Energy Commission. Method for producing a beam of polarized atoms. 3,700,899, Cl. 250-84.000.

Kanazawa, Kay Keiji; Seiki, Hajime; and Street, George Bryan, to International Business Machines Corporation. Process for making electrophotographic plates. 3,700,498, Cl. 117-230.000.

Kanda, Masao: *See*—
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Kanegafuchei Boski Kaisha: *See*—
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Kanegafuchi Boseki Kabushiki Kaisha: *See*—
Matsui, Masao; Tokura, Susumu; and Yamabe, Masahiro, 3,700,545.

Kaneko, Hidehiko; Aritomi, Jiro; and Nakamura, Keiji, to Dainippon Pharmaceutical Co., Ltd. Aminoalkanol esters and their pharmaceutically acceptable acid-addition salt. 3,700,680, Cl. 260-295.50r.

Kanter, Jerome J. Coating ferrous base metal articles. 3,700,505, Cl. 148-6.350.

Kantorski, Joseph W., to American Optical Corporation. Method of making a lens balanced laser rod and rod produced thereby. 3,700,423, Cl. 65-30.000.

Kappeler, Heinrich; and Wild, Jost, to Givaudan Corporation. Process for the manufacture of lavandulic acid and derivatives. 3,700,717, Cl. 260-465.200.

Karasawa, Kazuo: *See*—
Suzuki, Yoshiji; Hayashi, Ikuo; Karasawa, Kazuo; and Shimada, Mitsuhiro, 3,700,953.

Karlen, Harvey R., to Cory Corporation. Anti-siphon and vent means for use with an open-to-atmosphere hot water supply tank. 3,699,944, Cl. 126-362.000.

Karr, Lawrence J.; and Fried, Norman, to TRW Inc. Coaxially adjusted optical mount. 3,700,313, Cl. 350-288.000.

Kartridg Pak Co., The: *See*—
Moore, Lowell B.; Keating, Raymond J.; and Underwood, Warren, 3,700,387.

Karweil, Joachim; and Degel, Josef, to Bergwerksverband G.m.b.H. Method of reactivating spent activated coal. 3,700,563, Cl. 201-1.000.

Kasai, Keiji: *See*—
Sakamoto, Kenro; Tanaka, Motoaki; Hanzawa, Teruo; and Kasai, Keiji, 3,700,454.

Kaspar, Emanuel: *See*—
Hempel, Gerhard; Wieske, Reinhold; Krieger, Bernhard; and Kaspar, Emanuel, 3,700,660.

Kastenbein, Ernest L.; and Geltman, Gerald L., to Allied Chemical Corporation. Dielectric compositions. 3,700,597, Cl. 252-63.200.

Katagiri, Toshio: *See*—
Tatematsu, Kenzo; Hosono, Hiroo; Katagiri, Toshio; Hayashi, Yoshiaki; and Ando, Hiroyuki, 3,700,818.

Katchalski, Ephraim: *See*—
Zabicky-Zisaman, Jacobo Zelik; Oren, Ida; and Katchalski, Ephraim, 3,700,610.

Kaufman, Harold B., Jr.: *See*—
Schiffmann, Robert F.; Stein, Ernest W.; and Kaufman, Harold B., Jr., 3,699,899.

Kaufman, Warren F., to Philco-Ford Corporation. Gas sampler. 3,699,814, Cl. 73-421.500.

Kawada, Shin-Ichi, to Kabushikikaisha Tokyo Keiki Seizosho Tokyo Keiki Seizosho Co., Ltd. Cyroscopic instrument. 3,699,657, Cl. 33-324.000.

Kawasaki, Akihiro; and Maruyama, Isao, to Maruzen Petrochemical Co., Ltd. Process for preparing alternating copolymer of butadiene and olefine. 3,700,638, Cl. 260-84.100.

Kawashima, Katsuhiko, to Mitsubishi Denki Kabushiki Kaisha. Logarithmic amplifier. 3,700,918, Cl. 307-230.000.

Kawashima, Koji: *See*—
Ishikawa, Teruo; Kawashima, Koji; and Togashi, Tetuo, 3,700,846.

Kawasumi, Shohachi: *See*—
Nakaguchi, Kohei; Kawasumi, Shohachi; Hirooka, Masaaki; and Yabuuchi, Hiroshi, 3,700,647.

Keating, Raymond J.: *See*—
Moore, Lowell B.; Keating, Raymond J.; and Underwood, Warren, 3,700,387.

Keen, Ralph S., Jr., to General Instrument Corporation. Fabrication of integrated microcircuit devices. 3,700,508, Cl. 156-3.000.

Keene, Carl E.; and Bradley, Ruth D. Masking techniques for use in fabricating microelectronic components. 3,700,510, Cl. 156-11.000.

Keene Corporation: *See*—
Kruger, Michael H., 3,699,872.

Keene, Derek K.; and Mc Elhare, John J., to Eaton Corporation. Traction mechanism actuated pressure source. 3,700,060, Cl. 180-53.0ff.

Kehr, Clifton L.; and Wszolek, Walter R., to Grace, W. R., & Co. Photocurable liquid polyene-polythiol polymer composition. 3,700,574, Cl. 204-159.140.

Keijzer, Johan H.: *See*—
Fader, John H.; Keijzer, Johan H.; and Graulus, Marcel Josef Roger, 3,700,225.

Keim, Gerald I., to Hercules Incorporated. Reaction products of epihalohydrin and polymers of diallylamine and their use in paper. 3,700,623, Cl. 260-80.30r.

Keithley, Harry E.; and Helrigel, Robert A., to Gulf & Western Industrial Products Company. Knockout bar assembly for presses. 3,699,882, Cl. 100-218.000.

Keldmann, Erik: *See*—
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Keller, Hans, to ITT Industries, Inc. Method of amplitude control of electromechanical oscillators. 3,701,052, Cl. 331-116.00m.

Keller, Joseph Richard: *See*—
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Kelly, Cornelius J., Jr., to K-Tech, Inc. Electronic components. 3,701,077, Cl. 339-17.0cf.

Kelly, Earl K., to McDonnell Douglas Corporatn. Rivet slug injector. 3,700,139, Cl. 221-241.000.

Kelly, James E.: *See*—
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Kendall Company, The: *See*—
Hielema, Ralph, 3,700,520.

Kennedy, Bobby W., to United States of America, National Aeronautics and Space Administration. Polyimide resin-fiberglass cloth laminates for printed circuit boards. 3,700,538, Cl. 161-93.000.

Kennedy, Ray L., to Tel-E-Lect, Inc. Dielectrically extensible boom structure. 3,699,851, Cl. 92-119.000.

Kenney, Edward J.: *See*—
Sundby, Bjorn; Kenney, Edward J.; and Wixon, Harold E., 3,700,607.

Kenney, Jerald R. Putting cup arrangement for golf practice. 3,700,243, Cl. 273-178.00r.

Kerley, James J., Jr.; and Schaller, Norman C., to United States of America, National Aeronautics and Space Administration. Apparatus for vibrational testing of articles. 3,699,807, Cl. 73-71.600.

Kerr-McGee Corporation: *See*—
Koerner, Ernest L., Jr.; and Lucid, Michael F., 3,700,415.
Lucid, Michael F., 3,700,416.

Ketchum, Elmer, Jr., to Combustion Engineering, Inc. Diffuser. 3,700,173, Cl. 239-405.000.

Ketterer, Stanley J., to Singer Company, The. Self-threading needle. 3,699,911, Cl. 112-224.000.

Keystone Engineering Company: *See*—
Boeck, Gunther A., 3,700,301.

Kidd, Arthur H., to Condes Corporation. Machine for making hanging file folders. 3,699,633, Cl. 29-211.00d.

Kidd, Arthur H., to Condes Corporation. Machine for making hanging file folders. 3,700,528, Cl. 156-475.000.

Kiel, Othar M.: *See*—
Terry, William M.; Graham, John W.; Sinclair, Albert R.; and Kiel, Othar M., 3,700,032.

Kieserling, Th., & Albrecht Werkzeugmaschinenfabrik: *See*—
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Kiess, Reinhold: *See*—
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Kihara, Mitsuji: *See*—
Kokubo, Ryo; Takakuwa, Yasuo; Shiroishi, Akihiro; and Kihara, Mitsuji, 3,700,672.

Kikuchi, Reizo. Method of erecting suspended scaffolding at construction field and scaffolding erected thereby. 3,700,071, Cl. 182-150.000.

Kilbride, Robert S.: *See*—
Kurk, Kenneth G.; and Kilbride, Robert S., 3,700,127.

Killion, Derling G., to Ryan Aeronautical Company. Antenna array beam scanning system. 3,701,156, Cl. 343-117.00a.

Kimberly-Clark Corporation: *See*—
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Nelson, Howard N., 3,700,138.

Kimura, Fumiyuki: *See*—
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Kimura, Yoh, to Nishikawa Rubber Co., Ltd. Packing strip structure. 3,699,718, Cl. 49-491.000.

Kindig, Guilford Edwin, to Eastman Kodak Comny. Positively operated stripping device for cameras. 3,699,862, Cl. 95-13.000.

King, John Calaby, to Concrete Formwork Engineers Pty., Ltd. Scissors-type linkage. 3,700,070, Cl. 182-16.000.

King Nutronics Corporation: *See*—
Waldron, Bradley C., 3,699,800.

King, Oliver F. Method for improving fuel combustion in a furnace and for reducing pollutant emissions therefrom. 3,699,903, Cl. 110-1.00j.

King, Percy; and Garrett, Howard R., to Haskon Incorporated. Container fabricating machine. 3,699,743, Cl. 53-186.000.

Kingsbury, Richard F.: *See*—
Isaac, George L.; Kingsbury, Richard F.; and Surak, John G., 3,701,021.

Kinoshita, Ryohei; and Ishizawa, Masami, to Fujitsu Limited. Push-button switch. 3,701,064, Cl. 335-205.000.
Kinsell, Earl G. Minnow seine poles. 3,699,700, Cl. 43-14.000.
Kirkham, Arthur J. Modular shelter system. 3,699,986, Cl. 135-1.00r.
Kirsch, Maurice: *See—*
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Kishida, Yukichi: *See—*
Iwai, Issei; Kishida, Yukichi; and Iwashige, Tadahiro, 3,700,688.
Kitai, Kiyoshi, to Kabushiki Kaisha Hattori Tokeiten. Camera shutter operating mechanism. 3,699,866, Cl. 95-63.000.
Kitamura, Yuko: *See—*
Shimauchi, Shiro; Kitamura, Yuko; Iwabuchi, Osamu; and Matsui, Takeshi, 3,700,399.
Kitano, Hisao; and Tanimoto, Fumio. Method for manufacturing purified isocyanurates. 3,700,667, Cl. 260-248.0ns.
Kitrilakis, Sotiris; and Robinson, Thomas C., to Tecna Corporation. Percutaneous lead device. 3,699,956, Cl. 128-348.000.
Kitrilakis, Sotiris, to Tecna Corporation. Surface or lining compatible with blood or other tissue. 3,700,380, Cl. 3-1.000.
Klawson, Rennold L.: *See—*
Cousins, Morison S.; Klawson, Rennold L.; and Watson, Roy, 3,700,146.
Kleckner, Harold F., to McDonnell Douglas Corporation. Turbofan engine thrust reverser. 3,699,682, Cl. 60-226.00a.
Kleman, Jerry L.: *See—*
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Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Howe, Hans-Ulrich, 3,699,852.
Klotzbach, Kurt, to American Spin-A-Batch Company. Apparatus for conveying glass panes through a processing plant. 3,699,818, Cl. 74-37.000.
Klygis, Mindaugas Julius, to Illinois Tool Works Inc. Multiple container carrier. 3,700,276, Cl. 294-87.200.
Kmecak, Ronald A.: *See—*
Kovach, Stephen M.; Patrick, Ralph E.; and Kmecak, Ronald A., 3,700,745.
Knabe, Uwe, to Holstein & Kappert Maschinenfabrik Phonix GmbH. Method and apparatus for filling bottles or can with beer or the like. 3,699,740, Cl. 53-22.00r.
Knapp, Richard V.: *See—*
Stobbe, Richard P.; and Knapp, Richard V., 3,700,904.
Knapsack Aktiengesellschaft: *See—*
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Knechel, William F., to Eastman Kodak Company. Antistain agents comprising mixtures of secondary-alkylhydroquinones. 3,700,453, Cl. 96-74.000.
Knecktel, Wilhelm Josef; and Schaffer, Detlef, to Canon Kabushiki Kaisha, mesne. Electrophotographic apparatus. 3,699,992, Cl. 137-93.000.
Knell, Bernhard, to Concast AG. Method of continuously casting steel billets. 3,700,024, Cl. 164-83.000.
Knight, John H., to Simmonds Precision Products, Inc. High speed electrical counter. 3,700,864, Cl. 235-92.00f.
Knight, Paul A.; Saunders, James R.; and Stapleton, Fred E., to Mandrel Industries, Inc. Gas operated seismic cource employing and inflatable member. 3,700,066, Cl. 181-.5nc.
Knowles, James H.; Ball, Billie Joe; and Fitzgerald, Donald F. Local and national warning alarm system. 3,701,024, Cl. 325-364.000.
Kobayashi, Kenro: *See—*
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Kobayashi, Torao; and Sato, Masatoshi, to Kyoritsu Noki Co., Ltd. Vibration absorbing device for portable machine. 3,700,015, Cl. 143-32.00r.
Kobler, Ulrich: *See—*
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Koch, Earl E.; and Shriver, Joe E., to Sperry Rand Corporation. Conditioner mounting for a windrower. 3,699,754, Cl. 56-15.800.
Kocks, Friedrich: *See—*
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Koda, Akio: *See—*
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Koeber, Henry J., to Bell & Howell Company. Retracted film take-up driver. 3,700,317, Cl. 352-91.000.
Koehler-Dayton, Inc.: *See—*
Cornish, Alan H.; Helke, Robert C.; Le Donne, Alex N.; and Masters, Hugh E., 3,700,565.
Koehring Company: *See—*
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Koening, A. G., mesne: *See—*
Nepereny, Harold A.; and Reich, John P., 3,699,750.
Koerner, Ernest L., Jr.; and Lucid, Michael F., to Kerr-McGee Corporation. Vanadium recovery from wet process phosphoric acid using neutral organo-phosphorus extractants. 3,700,415, Cl. 23-312.0me.
Koff, Bernard L.: *See—*
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Koga, Hirohumi; and Sato, Ryuichi, to Omron Tateisi Electronics Co. Electromagnetic relay. 3,701,062, Cl. 335-135.000.
Koide, Masashi: *See—*
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Kokubo, Ryo; Takakuwa, Yasuo; Shiroishi, Akihiro; and Kihara, Mitsuji, to Nissan Kagaku Kogyo Kabushiki Kaisha. Process for recovering by-product gases at high pressure in melamine production. 3,700,672, Cl. 260-249.70p.
Kokubu, Tatsuo: *See—*
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Kokusai Denki Kabushiki Kaisha: *See—*
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Komatsu, Tokuji, to Tsudakoma Industrial Co., Ltd. Apparatus for detecting the tension of yarns delivered from a rotary yarn beam. 3,699,809, Cl. 73-143.000.
Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH: *See—*
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Koopman, Donald E.: *See—*
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Kopec, John C.; Schmitt, Henry O., Jr.; and Tenney, Frederick H., to United States of America, Navy, mesne. Controlled variable time radio proximity fuze. 3,699,892, Cl. 102-70.200.
Kopp, Harold W. Two-piece football dummy. 3,700,237, Cl. 273-55.00a.
Koppy Corporation, mesne: *See—*
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Korpel, Adrianus: *See—*
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Koster, Claus: *See—*
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Kovach, Stephen M.; Patrick, Ralph E.; and Kmecak, Ronald A., to Ashland Oil Inc. Hydrodealkylation process with promoted group VIII metals. 3,700,745, Cl. 260-672.00r.
Kowalik, John J.: *See—*
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Krauss-Maffei Aktiengesellschaft: *See—*
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Kray, Louis R., to Chevron Research Company. Dialkyl phthalate process. 3,700,725, Cl. 260-475.00r.
Kreider, Kenneth G., to United Aircraft Company. Method for fabricating corrosion resistant composites. 3,699,623, Cl. 29-156.80b.
Kreuzer, John A.; and Thompson, David E., to Susquehanna Corporation, The. Rocket vehicle and method of manufacturing same. 3,699,891, Cl. 102-49.300.
Kreuzer, Lloyd Barton, to Bell Telephone Laboratories, Incorporated. Measurement of gas impurity concentration by infrared absorption spectroscopy. 3,700,890, Cl. 250-43.50r.
Krieger, Bernhard: *See—*
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Kritikos, Athanasios: *See—*
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Krohn, Rasmus: *See—*
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Kroll, Gert. Process for cleaning filter elements of fabric filter equipment. 3,699,747, Cl. 55-96.000.
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Kruger, Michael H., to Keene Corporation. Air distribution apparatus. 3,699,872, Cl. 98-40.00d.
Kruger, William P., to Hewlett-Packard Company. Automated vacuum port. 3,699,997, Cl. 137-32.00d.
Kruse, Jurgen M.; and Wyman, John E., to Itek Corporation. Process for coating substrates with polyethylene and products produced thereby. 3,700,495, Cl. 117-104.00r.
Kubik, Philip A. Fluid system. 3,700,356, Cl. 417-222.000.
Kubler, Manfred, to Dornier System GmbH. Damping device for satellites. 3,700,190, Cl. 244-1.0sa.
Kubo, Masaharu: *See*—
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Kubosaki, Masanobu: *See*—
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Kudo, Toshiyuki: *See*—
Naito, Fumio; Kudo, Toshiyuki; and Kubosaki, Masanobu, 3,700,596.
Kuehn, Erich, to Atlas Chemical Industries Inc. Flame retardant compositions. 3,700,739, Cl. 260-613.00r.
Kuhn, Klaus: *See*—
Sevenich, Theodor Josef; Fabian, Wolfgang; and Kuhn, Klaus, 3,700,122.
Kuhn, Rudolf: *See*—
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Kuhnen, Gottfried, to Aktiengesellschaft Brown, Boveri & Cie. Method for manufacturing liner body for combustion chambers and liner produced by the method. 3,699,641, Cl. 29-493.000.
Kuijper, Josephus Theodorus Maria, to U. S. Philip Corporation. Capacitive symmetrization of a storage. 3,701,114, Cl. 340-173.0sp.
Kullman, William G., to General Electric Company. Hinged surface heating unit system. 3,700,856, Cl. 219-451.000.
Kunio, Tone, to Tokyo Keidenki Kabushiki Kaisha. Transformer shorting device. 3,700,965, Cl. 317-15.000.
Kunst, Detlef, to Olympia Werke AG. Blocking device for the carriage of typewriters and similar machines. 3,700,088, Cl. 197-120.000.
Kunstmann, Martin Paul; and Porter, John Norman, to American Cyanamid Company. Antibiotic AM374 and method of production using streptomyces eburosporeus. 3,700,768, Cl. 424-118.000.
Kuramasu, Tetsuro: *See*—
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Kuraray Co., Ltd.: *See*—
Mizuno, Masao; and Igi, Keishiro, 3,700,642.
Kurechi, Taichi, to Fuji Photo Film Co., Ltd. Cinematograph film magazine. 3,700,316, Cl. 352-78.00c.
Kurk, Kenneth G.; and Kilbride, Robert S., to Moorman Manufacturing Company. Method for assembling layers of packages on a pallet. 3,700,127, Cl. 214-152.000.
Kurokawa, Tochio; Nishiyama, Shoji; Nagai, Katsumi; and Mochizuki, Yuu, to Toshio Kurokawa, Shoji Nishiyama and Tokyo Shibaura Electric Co., Ltd. Examinee fastening device for use in an X-ray photographing apparatus. 3,700,229, Cl. 269-328.000.
Kurtz, John A.: *See*—
Deverse, Frank T.; Kurtz, John A.; Rendon, Daniel; Trahn, Kenneth A.; and Tuttle, James W., 3,699,917.
Kusters, Norbert L.; and Moore, William J. M., to Canadian Patents and Development Limited. Phantom burden arrangement for current transformer calibration. 3,701,008, Cl. 324-55.000.
Kutino, Tuyoshi: *See*—
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Kuwabara, Yoshimi: *See*—
Soma, Nobuo; Watatani, Mitsuo; Nakazawa, Junichi; Sato, Yoshio; Kuwabara, Yoshimi; and Ishikawa, Hidehiko, 3,700,682.
Kuwahara, Ayako, to Industrial Science & Technology, Agency of. Motorized amusement car. 3,700,058, Cl. 180-21.000.
Kuwayama, Koji: *See*—
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Kyoritsu Noki Co., Ltd.: *See*—
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Kyowa Hakko Kogyo Co., Ltd.: *See*—
Nakayama, Kiyoshi; Tanaka, Haruo; and Hagino, Hiroshi, 3,700,557.
La Heij, Gerardus E.; and Van Amerongen, Gerrit J., to Shell Oil Company. Process for the preparation of gel-containing synthetic conjugated diene solution polymers. 3,700,757, Cl. 260-894.000.
La Pine, Anthony N.: *See*—
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La Ruas, Julius, to Moody Aquamatic Systems, Inc. Ozone purifier for pressurized water cooler. 3,699,776, Cl. 62-157.000.
Laane, Rein Raymond, to Bell Telephone Laboratories, Inc. Delta-modulation terminal circuit. 3,701,017, Cl. 325-38.00b.
L'Air Liquide, Societe Anonyme pour l'Etude et Exploitation des Procedes Georges Claude: *See*—
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Laisney, Alexis D., to Eastman Kodak Company. Electrophotographic fusing apparatus. 3,700,218, Cl. 263-6.00e.
Laizier, Jacques; and Waja, Georges. Method of preparation of hydrophilic silicones by radiochemical grafting. 3,700,573, Cl. 204-159.130.
Lake, William H., to General Electric Company. Metal halide lamp system. 3,700,960, Cl. 315-151.000.
Lale, Walter G. Articulated TV platform. 3,701,073, Cl. 339-5.00p.
Lalley, Donald P., to March Manufacturing Company, mesne. Pump impeller molding apparatus. 3,700,372, Cl. 425-159.000.
Lamb, Anthony H. Medical thermographic diagnostic means. 3,699,813, Cl. 73-342.000.
Lamorte, Michael F.: *See*—
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Landman, Dirk, to Berg Electronics, Inc. Hinge type circuit board connector block. 3,701,071, Cl. 339-4.000.
Landrum, Charles Rabun: *See*—
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Landry, Alfred. Sterilizer unit for fluid media. 3,700,406, Cl. 21-54.00r.
Landt, Uwe; Seifert, Helmut; and Bretchneider, Otto, to Knapsack Aktiengesellschaft. Process for the manufacture of potassium. 3,700,430, Cl. 75-66.000.
Lang, Gordon R., to E.S.E. Limited. Circuit and method for developing signal indicative of unknown frequency. 3,701,012, Cl. 324-79.00r.
Lang, Gunter A.: *See*—
Tregear, Geoffrey W.; Battaerd, Hendrik A. J.; Lang, Gunter A.; Catt, Kevin; and Niall, Hugh D., 3,700,609.
Lang, Paul C.; La Pine, Anthony N.; and Vaughn, Julian E., to International Business Machines Corporation. Random binary data signal frequency and phase compensation circuit. 3,701,039, Cl. 331 - 1.00a.
Lang, William J., to International Minerals and Chemical Corporations. Increase in clay responsiveness to wetting. 3,700,474, Cl. 106-288.00b.
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Langner, Carl G.; and Visser, Robert C., to Shell Oil Company. Method for connecting flowlines to a platform. 3,699,691, Cl. 61-72.300.
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Lankenau, Richard F. Bottom opening shellfish trap. 3,699,702, Cl. 43-100.000.
Lanvin, Jeanne: *See*—
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Lanvin, Lucie, to Lanvin, Jeanne. Wrist watch bracelet. 3,700,148, Cl. 224-4.00j.
Lapham, Sidney D. Drop platform structure for a loading dock. 3,699,599, Cl. 14-71.000.
Larkfeldt, Birger, to Aktiebolaget Svenska Flaktfabriken. Supply air device for injection of preferably cold ventilation air. 3,699,871, Cl. 98-40.00d.
Lasko, Charles J. Apparatus for removing floating liquids from the surface of a body of water. 3,700,109, Cl. 210-242.000.
Latinen, George A.: *See*—
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Lawrence, Benjamin; Wolfson, Alan B.; and Patel, Jayantilal M., to Procter and Gamble Company, The. Non-vacuum drying of decaffeinated green coffee beans. 3,700,465, Cl. 99-70.000.
Lawrence, Richard A. Trailer loading and unloading equipment. 3,700,124, Cl. 214-85.000.
Lawrenson, Thomas, to British Insulated Callender's Cables Limited. Multi-conductor electric cables. 3,700,786, Cl. 174-71.00a.
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Le Martret, Odile: *See*—
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Leimgruber, Willy; and Weigele, Manfred, to Hoffmann-La Roche Inc. Nuclear substituted derivatives of 1-hydroxy-6-methoxyphenazine 5, 10-dioxide. 3,700,679, Cl. 260-267.000.
Leister, Gerhard, to ABG-WERKE G.m.b.H. Road surfacing machines. 3,699,855, Cl. 94-46.000.
Lelay, Roland: *See*—
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Lenihan, Jeremiah P., to Mobil Oil Corporation. Process of forming time-variant filters for filtering seismic data. 3,701,091, Cl. 340-15.5af.
Lenning, Ronald L., to Cincinnati Milacron Inc. Adaptive control for a grinding machine. 3,699,720, Cl. 51-59.0ss.
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Lerner, Harry, to Itek Corporation. Physical development of a thin reversibly activatable photoconductor element having a resinous barrier layer. 3,700,449, Cl. 96-48.0pd.
Lerner, Irwin; and McGrath, Robert Paul, to Hoffmann-La Roche Inc. Diazepam and propantheline composition. 3,700,774, Cl. 424-244.000.
Levin, Paul; and Adamski, Maximilian, to General American Transportation Corporation. Sludge dewatering apparatus. 3,699,881, Cl. 100-118.000.
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Lewis, J. Stephen; Sapkus, Jurgis; Antell, Earl O.; and Robson, George E., to Mattel, Inc. Floppy foam doll. 3,699,715, Cl. 46-163.000.
Ley, Anthony John, to Solartron Electronic Group. Linearizing circuit for frequency domain transducers. 3,700,865, Cl. 235-150.530.
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Low, George M, Deputy Administrator of the; National Aeronautics andSpacadministration with; respect to an invention of; Fymat, Alain L.; and Abhyankar, Krishna D India. Interfereter-polarieter. 3,700,334, Cl. 35/106000.
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Lowe, James U., Jr.: *See*—
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Lowery, Ronald M.; and Summers, Daniel J., Jr., to Computest Corporation. Distortion analysis system and method. 3,700,808, Cl. 178-69.00a.

LTV Aerospace Corporation, mesne: *See—*
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Macleod, Norman; and Proctor, David, to National Research Development Corporation. Apparatus for measuring the concentration of dissolved oxygen in an aqueous solution. 3,700,580, Cl. 204-195.00p.
MacMillan, Robert T; and Jackson, Jesse, Jr., to United States of America, Interior. Method for producing solutions of high alumina concentration by alkaline extraction of aluminum-containing oil shale. 3,700,766, Cl. 423/119000.
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Manoogian, Alex, to Masco Corporation. Faucet valve. 3,700,210, Cl. 251-304.000.
Manoogian, Alex, to Masco Corporation. Faucet valve. 3,700,211, Cl. 251-304.000.
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Ryley, Derek Vernon; and Claydon, Gyongyver, 3,700,790.
Sosin, Boleslaw Marian, 3,701,038.
Marcus, Michael Jay, to Bell Telephone Laboratories, Incorporated. Time division switching system with time slot interchange. 3,700,819, Cl. 179-15.0aq.
Markevich, John Anthony, to Bell Telephone Laboratories, Inc. Reduction of harmonic distortion. 3,701,028, Cl. 328-167.000.
Markin, Joseph; and Sobel, Alan, to Zenith Radio Corporation. Matrix-type image display with light-guide addressing system. 3,700,802, Cl. 178-7.30d.
Marley, Robert R., to Motorola, Inc. Full-power/half-power logic gate. 3,700,915, Cl. 307-215.000.
Marsh, Lynn W.; and Schneiderhan, Edward M., to Mohawk Data Sciences Corporation. Control for chain printer. 3,699,884, Cl. 101-93.00c.
Marsh, Walter H. W.: *See—*
Urciola, John A.; and Marsh, Walter H. W., 3,699,910.
Martin, John Henry Edward James; and Porter, John Norman, to American Cyanamid Company. Antifungal BH 890. 3,700,769, Cl. 424-119.000.
Maruno, Fujiya: *See—*
Ashikawa, Noboru; and Maruno, Fujiya, 3,700,083.
Maruta, Isao: *See—*
Hamada, Takaki; Nakashio, Seizo; Maruta, Isao; Hayatsu, Kazuo; Seto, Tetsuki; and Kono, Yoichi, 3,700,630.
Maruyama, Isao: *See—*
Kawasaki, Akihiro; and Maruyama, Isao, 3,700,638.
Maruzen Petrochemical Co., Ltd.: *See—*
Kawasaki, Akihiro; and Maruyama, Isao, 3,700,638.
Marx, Frederick, Jr.: *See—*
Bjorn, James M.; and Marx, Frederick, Jr., 3,701,072.
Marx, George M., to Nu-Lite Fluorescent Mfg. Co., Inc. Latch and hinge structure for diffuser of fluorescent light fixture. 3,700,887, Cl. 240-147.000.
Masaki, Mitsuo; Fukui, Kiyoshi; Kuramasu, Tetsuro; and Ueda, Masahiro, to Ube Industries, Ltd. Process for the preparation of lactams. 3,700,656, Cl. 260-239.30a.
Maschinen- und Werkzeugbau GmbH: *See—*
Sevenich, Theodor Josef; Fabian, Wolfgang; and Kuhn, Klaus, 3,700,122.
Masco Corporation: *See—*
Manoogian, Alex, 3,700,210.
Manoogian, Alex, 3,700,211.
Mashita, Kentaro: *See—*
Hirooka, Masaaki; Yasui, Seimei; Mashita, Kentaro; and Kimura, Fumiyuki, 3,700,648.
Masnik, Walter. Mass flowmeter. 3,699,812, Cl. 07305.00d.
Mason, Robert P., to LogEtronics Inc. Radiographic reduction system. 3,700,329, Cl. 355-81.000.
Mason, Virginia S. Self-operating traction system. 3,699,953, Cl. 128-75.000.
Massillon Container Co.: *See—*
Farrell, John D., 3,700,160.
Masters, Hugh E.: *See—*
Cornish, Alan H.; Helke, Robert C.; Le Donne, Alex N.; and Masters, Hugh E., 3,700,565.
Masuhara, Toshiaki; Nagata, Minoru; and Kubo, Masaharu, to Hitachi, Ltd. Semiconductor integrated circuit composed of cascade connection of inverter circuits. 3,700,981, Cl. 317-235.00r.
Mathis, Buddy H. Offensive training coordinator. 3,700,238, Cl. 273-55.00r.
Mathner, Hermann: *See—*
Schruff, Horst; Lehmann, Helmut; Siefen, Jakob; Mathner, Hermann; Adams, Willi; and Weiss, Gunter, 3,700,531.
Matle, Calvin C.: *See—*
Goodrich, George W.; Colson, William B.; and Matle, Calvin C., 3,700,947.
Matsui, Masao, to Kanegafuchei Boski Kaisha. Composite sheath-core filaments having improved flexural rigidity. 3,700,544, Cl. 161-175.
Matsui, Masao; Tokura, Susumu; and Yamabe, Masahiro, to Kanegafuchi Boseki Kabushiki Kaisha. Synthetic multi-segmented fibers. 3,700,545, Cl. 161-175.000.
Matsui, Takeshi: *See—*

Shimauchi, Shiro; Kitamura, Yuko; Iwabuchi, Osamu; and Matsui, Takeshi, 3,700,399.
Matsumoto, Fumio: *See—*
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Matsumoto, Genya: *See—*
Yamagishi, Akio; Kondo, Hisashi; Matsumoto, Genya; and Kondo, Shigekatsu, 3,700,718.
Matsuoka, James T.; and Cantarutti, Armindo, to Intercole Automation, Inc. Continuous mixer with screw discharge control. 3,700,374, Cl. 425-208.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Egawa, Susumu; Ashizaki, Shigeya; Shimizu, Katsumi; and Miyati, Toshiko, 3,700,954.
Takeda, Yukio, 3,699,670.
Tatematsu, Kenzo; Hosono, Hiroo; Katagiri, Toshio; Hayashi, Yoshiaki; and Ando, Hiroyuki, 3,700,818.
Watanabe, Nobuatsu; and Fukuda, Masataro, 3,700,502.
Matsushita Electric Industrial Company, Limited: *See—*
Morita, Yasuyuki; and Nishino, Tsutomu, 3,700,322.
Matsushita Electronics Corporation: *See—*
Mizuno, Hiroyuki; Nakashima, Shinichi; and Miyai, Yukio, 3,701,050.
Mattauch, Robert J.: *See—*
United States of America, National Aeronautics & Space Administration, 3,700,897.
Mattel, Inc.: *See—*
Clarke, Charles D.; and Hartling, Donald C., 3,699,705.
Gardel, Robert; and Gorsky, Egon, 3,700,384.
Handler, Elliot; Beasley, Noel F.; Garcia, Armando J.; and May, Richard L., 3,699,712.
Lewis, J. Stephen; Sapkus, Jurgis; Antell, Earl O.; and Robson, George E., 3,699,715.
Sapkus, Jurgis, 3,699,707.
Sapkus, Jurgis; Lewis, J. Stephen; and Sporrong, Robert N., 3,699,713.
Matthey-Doret, William. Folding bed. 3,699,594, Cl. 5-99.000.
Mattingly, James E.: *See—*
Gaipo, Eugene T.; and Mattingly, James E., 3,699,934.
Mattson, John H.: *See—*
Meyers, James D.; and Mattson, John H., 3,700,235.
Mattsson, Mats Erik: *See—*
Englund, Gosta Roland; Eriksson, Bjorn Sven Hilding; Mattsson, Mats Erik; and Lindelow, Claes-Goran, 3,700,863.
Matuska, James E. Quickley removable pivotal and snubbed storage bin. 3,700,199, Cl. 248-292.000.
Maude, Stanley Morgan, to Alto Corporation. Article handling equipment. 3,700,129, Cl. 214-309.000.
May, Frederick T., to International Business Machines Corporation. Radix conversion circuits. 3,700,872, Cl. 235-155.000.
May, Richard L.: *See—*
Handler, Elliot; Beasley, Noel F.; Garcia, Armando J.; and May, Richard L., 3,699,712.
Mayeda, Thomas H., to General Motor Corporation. Cooled airfoil and method of making it. 3,700,418, Cl. 29-180.0ss.
Mayer, Frank, & Associates, Inc.: *See—*
Bramble, Ronald L., 3,699,699.
Maynard, Douglas Edward, to National Research Development Corporation. Electroencephalograph monitoring apparatus. 3,699,947, Cl. 128-2.10b.
Mc Elhare, John J.: *See—*
Keene, Derek K.; and Mc Elhare, John J., 3,700,060.
Mc Kusick, Blaine Chase, to Du Pont de Nemours E. I., and Company. 2(Substituted Phenyl)-8H-pyrazolo-(5,1a) isoindol-8-one. 3,700,689, Cl. 260-310.00r.
Mc Manus, Lynn S., to Baker Perkins Inc. Rack loading and unloading apparatus. 3,700,121, Cl. 214-16.40c.
McClusky, Stanley A. Two station receptacle and weighing apparatus. 3,700,054, Cl. 177-184.000.
McCoy, J. C.; and Steele, James W., to United States of America, Atomic Energy Commission. Carbon fiber structure and method of forming same. 3,700,535, Cl. 161-47.000.
McCulloch Corporation: *See—*
Smith, Stephen Hagar, 3,700,997.
McCurnin, Thomas W.: *See—*
Pulliam, Joseph H.; and McCurnin, Thomas W., 3,701,138.
McDonald, Keith A.: *See—*
Ellis, Nyron P.; Czubak, Albin S.; and McDonald, Keith A., 3,699,724.
McDonald, William J., to Minnesota Mining and Manufacturing Company. Abrasive article and method of fabrication. 3,699,727, Cl. 51-334.000.
McDonnell Douglas Corporation: *See—*
Anderson, Raymond H., Jr.; and Whiteson, Bennett V., 3,699,798.
Dobbs, Richard A.; and Holmes, Richard N., 3,700,067.
Kleckner, Harold F., 3,699,682.
Little, Jane, 3,699,847.
Rhoton, Ronald L., 3,699,696.
Zuleeg, Rainer; and Ranon, Uri, 3,701,043.
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McGinnis, Herbert E.: *See—*
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McGrath, Robert Paul: *See—*
Lerner, Irwin; and McGrath, Robert Paul, 3,700,774.
McKinney, Edward J., to United States of America, Navy. Matched filter. 3,701,154, Cl. 343-18.00e.
McLeod, Gerald L.; French, Hollis E.; Case,Laura K.; Berman, Elliot; and Casella, Joseph, to Itek Corporation. Dodging method in which the photochromic material is stable to light and heat. 3,700,440, Cl. 96-27.00r.
McMaster, Harold A., to Guardian Industries Corporation. Apparatus for conveying glass sheets through adjacent bending and tempering stations. 3,700,425, Cl. 65-348.000.
McMennamin, Roy B.: *See—*
Lee, Don N.; and McMennamin, Roy B., 3,700,998.
McMillan, Norman: *See—*
Helms, Clifford J.; McMillan, Norman; and Papadopoulos, Stelios B., 3,700,855.
McTeer, Lucian W., to Union Carbide Corporation. Di (1-acyloxy-aliphatic) ethers and derivatives thereof. 3,700,722, Cl. 260-486.00r.
McWilliams, Donald A. Method of and apparatus for regulating the resistance of film resistors. 3,699,649, Cl. 29-610.000.
Mead Corporation, The: *See—*
Calvert, Rodney K.; and Landrum, Charles Rabun, 3,699,666.
Mead Johnson & Company: *See—*
Weber, Abraham; and Frossard, Jacques Jean, 3,700,663.
Mears, Robert A.: *See—*
Johnson, Sam H., Jr.; Mears, Robert A.; and Park, Vernon K., 3,700,758.
Mech-El Industries, Inc.: *See—*
Hermanns, Leonard S., 3,700,155.
Hermanns, Leonard S., 3,700,156.
Medical Development Corporation: *See—*
Holbrook, Legrand K., 3,699,815.
Medical Plastics, Inc.: *See—*
Bolduc, Lee R., 3,699,968.
Mehnert, Walter E.: *See—*
Brauser, Klaus J.; Kritikos, Athanasios; Kroy, Walter; and Mehnert, Walter E., 3,701,131.
Meinzer, Richard August: *See—*
Bronfin, Barry Robert; Burwell, Wayne Gregory; and Meinzer, Richard August, 3,701,045.
Meisei Chemical Works, Ltd.: *See—*
Noda, Masajiro; Kajita, Hiroyuki; and Kuwayama, Koji, 3,700,402.
Meldrum, David R., to Cities Service Company. Method of producing a pearlescent basic lead carbonate pigment. 3,700,475, Cl. 106-291.000.
Meldrum, David R., to Cities Service Company. Method of producing pearlescent basic lead carbonate pigment. 3,700,476, Cl. 106-291.000.
Melvin, James A., Jr.: *See—*
Chace, Donald E.; Melvin, James A., Jr.; Ricketts, Alan W., Jr.; Steinberger, Edward P.; and Symmes, David T., 3,701,113.
Memery, James P., to United States of America, Navy. Compressor blade root seal. 3,700,354, Cl. 416-219.000.
Memorex Corporation: *See—*
Applequist, James E., 3,700,985.
Murashige, Robert H., 3,700,480.
Mencacci, Samuel A., to International Machinery Corporation, S.A. Apparatus for canning fish. 3,700,386, Cl. 53-23.000.
Meraz, Daniel, Jr.; and Simshauser, Anthony J., to United States of America, Navy. Ignition band and cover assembly. 3,699,893, Cl. 102-70.200.
Merck & Co., Inc.: *See—*
Hinkley, David F., 3,700,730.
Hoff, Dale R.; and Rooney, Clarence S., 3,700,685.
Robinson, Franklin M.; and Anderson, Paul S., 3,700,734.
Shen, Tsung-Ying, 3,700,776.
Merck and Co., Inc.: *See—*
Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L., 3,700,773.
Merideth, John G. Modular structural plaque assembly. 3,699,738, Cl. 52-578.000.
Mermelstein, Seymour, to Tyco Laboratories, Inc. Precision linear motion converting and position measuring apparatus. 3,699,819, Cl. 74-25.000.
Merriam, Asaph U.: *See—*
Veltri, Richard D.; Merriam, Asaph U.; and Basche, Malcolm, 3,700,486.
Messerschmilt-Bolkow-Blohm Gesellschaft mit: *See—*
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Messerschmitt-Bolkow-Blohm GmbH: *See—*
Brauser, Klaus J.; Kritikos, Athanasios; Kroy, Walter; and Mehnert, Walter E., 3,701,131.
Metallgesellschaft Aktiengesellschaft: *See—*
John, Willibald; Schmalfeld, Paul; Lange, Paul; and Rammler, Roland, 3,700,564.
Metil, Ignatius, to Ameron, Inc. Acid catalyst system for furan resins of filler containing acid salts. 3,700,604, Cl. 252/428,000.
Mettler Instrumente A.G.: *See—*
Buchmann, Hans, 3,700,056.
Meusburger, Lyle M.: *See—*
Sosalla, Harry; Meusburger, Lyle M.; and Jarnagin, Max L., 3,700,040.
Meyer, Daniel A.: *See—*

Ford, Bryce W.; Meyer, Daniel A.; and Warner, Walter C., 3,699,808.
Meyer, Leo F.: *See*—
Tamol, Ronald A.; and Meyer, Leo F., 3,699,973.
Meyers, James D.; and Mattson, John H. Circular billiard table with curved and straight bumper sections. 3,700,235, Cl. 273-9.000.
Michel, Walter A. Waveform abnormality monitor. 3,699,946, Cl. 128-2.06a.
Michigan Carton Co.: *See*—
Bundy, Patrick L., 3,700,161.
Michl, Karl-Heinz: *See*—
Breuer, Hans; Manner, Erich; and Michl, Karl-Heinz, 3,700,759.
Micro 8 Company, mesne: *See*—
Peters, Arnis E., 3,700,321.
Micromatic Hone Corporation: *See*—
Ellis, Nyron P.; Czubak, Albin S.; and McDonald, Keith A., 3,699,724.
Mihailovski, Alexander, to Stauffer Chemical Company. 1-picolyl-3-phenyl ureas. 3,700,678, Cl. 260-295.00e.
Milberger, Walter E.; and Weigle, Wayne L., to Westinghouse Electric Corporation. Fast pulldown transmission line pulser. 3,700,928, Cl. 307-268.000.
Miles, Leon H., to Atlantic Richfield Company. Method for drilling and completing a well and a packer fluid therefor. 3,700,050, Cl. 175-65.000.
Miller, David A.: *See*—
Johnson, Kenneth V.; and Miller, David A., 3,700,115.
Miller, George J.: *See*—
Lytton, Kenneth G.; Hullett, David F.; and Miller, George J., 3,700,091.
Miller, Henry C., to Pennwalt Corporation. Decolorized polytetrafluoroethylene. 3,700,627, Cl. 260-45.850.
Miller, James A.: *See*—
Ference, Richard N.; Grega, Albert; Miller, James A.; Stewart, Ray T.; and Stricker, David M., 3,700,101.
Miller, John J.; and Rychlewski, Thaddeus V., to Sylvania Electric Products, Inc. Method of forming a cathode ray tube screen. 3,700,444, Cl. 96-36.100.
Miller, Joseph W., Jr.: *See*—
Tuccinardi, Thomas E.; and Miller, Joseph W., Jr., 3,701,004.
Miller, Oscar. Hair trimmer. 3,699,653, Cl. 30-30.000.
Miller Printing Machinery Co.: *See*—
Mowry, Harry E., 3,699,831.
Miller, Stephen H.: *See*—
Bradford, James C.; Miller, Stephen H.; and Robertson, Jeffrey C., 3,700,188.
Millington, Alan Dennis: *See*—
Bentvelzen, Joseph Maria; and Millington, Alan Dennis, 3,700,536.
Minchak, Edward F., to Preformed Line Products Company. Marine toilet assembly. 3,699,592, Cl. 4-90.000.
Minnesota Mining and Manufacturing Co.: *See*—
Sorgenfrei, Frederick J., 3,700,419.
Minnesota Mining and Manufacturing Company: *See*—
Bingham, Wallace Karl, 3,700,305.
Bingham, Wallace Karl, 3,700,478.
McDonald, William J., 3,699,727.
Mitsch, Ronald A.; and Koshar, Robert J., 3,700,737.
Minsk, Louis Morton: *See*—
Brust, David Philip; Minsk, Louis Morton; and Abel, Edward Peter, 3,700,635.
Minsky opytny zavod Spetsialnogo Konstruktoskogo Bjuro No. 3: *See*—
Perminov, Evgeny Mikhailovich, 3,699,844.
Mirsch, John Walter, to RCA Corporation. Color picture tube beam convergence apparatus. 3,701,065, Cl. 335-212.000.
Misuraca, Louis J. Integrated and functionally improved electric erasing machine and accessory tool. 3,699,825, Cl. 74-527.000.
Mitrofanoff, Nicholas S.: *See*—
Finnegan, Edward D.; Harper, Leonard Roy; Mitrofanoff, Nicholas S.; and Slutman, Allen C., 3,701,105.
Mitsch, Ronald A.; and Koshar, Robert J., to Minnesota Mining and Manufacturing Company. Perfluoroalkyl vinyl sulfones. 3,700,737, Cl. 260-60.00a.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Kawashima, Katsuhiko, 3,700,918.
Mitsubushi Petrochemical Co., Ltd.: *See*—
Tago, Satoshi, 3,700,764.
Miyai, Yukio: *See*—
Mizuno, Hiroyuki; Nakashima, Shinichi; and Miyai, Yukio, 3,701,050.
Miyati, Toshiko: *See*—
Egawa, Susumu; Ashizaki, Shigeya; Shimizu, Katsumi; and Miyati, Toshiko, 3,700,954.
Miyoshi, Noriomi, to Fuji Denki Seizo Kabushiki Kaisha. Current circuit breaker. 3,700,970, Cl. 317-58.000.
Mizoguchi, Tomishige: *See*—
Yamamura, Yuichi; Kokubu, Tatsuo; Shigezane, Keisuke; and Mizoguchi, Tomishige, 3,700,651.
Mizuno, Hiroyuki; Nakashima, Shinichi; and Miyai, Yukio, to Matsushita Electronics Corporation. Solid state microwave oscillating device. 3,701,050, Cl. 331-107.00r.
Mizuno, Masao; and Igi, Keishiro, to Kuraray Co., Ltd. Polyester-polyoxyalkylene sufonate compositions. 3,700,642, Cl. 260-755.000.
Mizuno, William G.; Copeland, James L.; and Scholze, Arlene E., to Economics Laboratory, Inc. Composition for mechanically cleaning hard surfaces. 3,700,599, Cl. 252-99.000.
Mo och Domsjo Aktiebolag: *See*—
Croon, Ingemar Liss-Albin; and Blomqvist, Nils Verner, 3,700,549.
Mobil Oil Corporation: *See*—
Butter, Stephen A., 3,700,706.
Chen, Nai Yuen; Lucki, Stanley J.; and Garwood, William E., 3,700,585.
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Mochizuki, Yuu: *See*—
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Modern Caster Co., Inc.: *See*—
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Moeller & Neumann GmbH: *See*—
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Mogil, Bernard: *See*—
Aasen, Torulf F.; Mogil, Bernard; and Sepulveda, William, Jr., 3,700,231.
Mohawk Data Sciences Corporation: *See*—
Marsh, Lynn W.; and Schneiderhan, Edward M., 3,699,884.
Mohon, Windell N.; and Rodemann, Alfred H., to United States of America, Navy. Vacuum film holder for holograms. 3,700,302, Cl. 350-3.500.
Mohri, Yohichi, to Nissan Motor Company, Limited. Line pressure regulator valve. 3,699,994, Cl. 137-115.000.
Molex Incorporated: *See*—
Baumanis, Bruno, 3,701,082.
Molins Machines Company Limited: *See*—
Powell, Gordon Francis Wellington; and Preston, Edward George, 3,699,974.
Molnar, Laszlo A., to North American Rockwell Corporation. Capture combination system. 3,700,784, Cl. 84-345.000.
Mommens, Jacques H.: *See*—
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Monacelli, Walter J.: *See*—
D'Alelio, Gaetano F., 3,700,671.
Monaghan, Frank, to M & H Plastics, Inc. Method and apparatus for tubular articles. 3,700,529, Cl. 156-501.000.
Mongini-Tamagnini, Carla: *See*—
Gaggero, Giancarlo; Mongini-Tamagnini, Carla; and Settipani, Antoine, 3,700,162.
Monnens, Jacques H.: *See*—
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Monroe Belgium N.V.: *See*—
Fader, John H.; Keijzer, Johan H.; and Graulus, Marcel Josef Roger, 3,700,225.
Monsanto Company: *See*—
Bergomi, Joseph G., Jr., 3,700,492.
Butler, Robert G.; Carter, Don E.; and Latinen, George A., 3,700,247.
Hyndman, Harry L., 3,700,778.
Mottus, Edward H.; and Ort, Morris R., 3,700,710.
Nickerson, Ralph F.; and Weymouth, Harold D., 3,700,611.
Monsanto Research Corporation: *See*—
Cornell, John H., 3,700,426.
Montean, John, Jr., to Ohio Moulding Corporation, The. Roof bow device. 3,700,277, Cl. 296-104.000.
Montecatini Edison S.p.A.: *See*—
De Varda, Giuseppe, 3,700,581.
Monteith, James H.: *See*—
Maiden, Donald L.; Monteith, James H.; and Carpini, Thomas D., 3,699,811.
Montgomery, Edgar L. Guitar pick. 3,699,838, Cl. 84-322.000.
Montgomery, William C., Jr.; and Vogel, Charles B., to Shell Oil Company. Multiple multiplexer gain-ranging amplifier. 3,700,871, Cl. 235-154.000.
Moody Aquamatic Systems, Inc.: *See*—
La Ruas, Julius, 3,699,776.
Moody, Renville O.: *See*—
Nanne, Silvio Edward; and Moody, Renville O., 3,700,347.
Moore, Lowell B.; Keating, Raymond J.; and Underwood, Warren, to Kartridg Pak Co., The. Vacuum bagging machine. 3,700,387, Cl. 53-77.000.
Moore, Peter N.; and Pierce, Leo F. Mud flap and mounting means. 3,700,260, Cl. 280-154.50r.
Moore, Thomas. Motor overload protector and voltage cut-out device. 3,700,964, Cl. 317-13.
Moore, William J. M.: *See*—
Kusters, Norbert L.; and Moore, William J. M., 3,701,008.
Moorman Manufacturing Company: *See*—
Kurk, Kenneth G.; and Kilbride, Robert S., 3,700,127.
Moray, Forest J. Adjustable valve stem oil seals for old and new internal combustion engines. 3,699,942, Cl. 123-188.00p.
Morgenberger, Peter C. Wheel dolly for lifting snowmobiles and the like. 3,700,212, Cl. 254-131.000.

Morgenstern, Stanley W. Method and apparatus for sample analysis on a continuous flow basis. 3,700,562, Cl. 195-103.50r.
Morita, Yasuyuki; and Nishino, Tsutomu, to Matsushita Electric Industrial Company, Limited. Photographing arrangement for use with a cathode-ray tube. 3,700,322, Cl. 355-1.000.
Morley, Cyril William James. Wet processing installation. 3,699,983, Cl. 134-76.000.
Morrensen, Clarence B.: *See—*
Gerlach, John R.; and Morrensen, Clarence B., 3,699,788.
Morris, Philip, Incorporation: *See—*
Tamol, Ronald A.; and Meyer, Leo F., 3,699,973.
Morrow, Paul. Monitoring circuit for detecting leakage currents. 3,700,966, Cl. 317-18.00d.
Mortimer, Frank R.; Brewster, Alan R.; and Bartram, Michael J., to Dunlop Company Limited, The. Braking systems. 3,700,075, Cl. 188-346.000.
Morton-Norwich Products, Inc., mesne: *See—*
Watson, Edward John, Jr., 3,700,673.
Moschopedis, Speros E.; Czakert, Ernst; and Creighton, Stephen M., to Canadian Patents and Development Limited. Solubilization of humic acids, lignites and coals. 3,700,728, Cl. 260-507.00r.
Moser, Wilhelm: *See—*
Dillenburg, Helmut; Honig, Helmut; and Moser, Wilhelm, 3,700,414.
Mosinee Paper Corporation: *See—*
Diring, James A.; Engel, John B.; and Broeren, John E., 3,700,181.
Mosler Safe Company, The: *See—*
Potzick, Anthony J., 3,699,789.
Motis, Gilbert M., to Coats Company, Inc., The. Tire servicing and inflating apparatus. 3,700,021, Cl. 157-1.100.
Motorola, Inc.: *See—*
Bennett, Leonard W.; Hutchinson, Thomas R.; and Schilling, Winston H., 3,701,016.
Dame, John S., 3,701,150.
Davidson, John R., 3,700,811.
Frederiksen, Thomas M., 3,700,929.
Frederiksen, Thomas M.; and Long, Ernest L., 3,701,031.
Gay, Michael J., 3,700,921.
Griffey, Donald E., 3,700,796.
Groth, Edward John, Jr., 3,701,018.
Hanley, Harold G.; and Williamson, Edward E., 3,699,612.
Johnson, Robert Henry, 3,701,158.
Lunn, Gerald K., 3,700,977.
Marley, Robert R., 3,700,915.
Nilssen, Ole K., 3,699,817.
Palac, Kazimir, 3,700,948.
Stiles, Charles W., 3,701,055.
Vargas, Robert J., 3,699,940.
Mottus, Edward H.; and Ort, Morris R., to Monsanto Company. Methylene bis (aluminum dihalides) useful as polymerization catalyst components. 3,700,710, Cl. 260-448.00a.
Mourier, Emile. Process for producing acetylenic alcohols. 3,700,740, Cl. 260-631.500.
Mowry, Harry E., to Miller Printing Machinery Co. Cutter and creaser. 3,699,831, Cl. 83-94.000.
Moyer, Donald W.: *See—*
Swanson, William C.; Moyer, Donald W.; and Asmus, Rodger W., 3,699,678.
Moyer, Rudolph H.: *See—*
Anderson, Howard H.; Moyer, Rudolph H.; Sibbert, Donald, J.; and Sutherland, David C., 3,700,896.
Mrugala, Joseph V., to Sylvania Electric Products Inc. Pressurized universal holding device. 3,700,226, Cl. 269-22.000.
Mueller Co.: *See—*
Hackman, Frank C., 3,700,008.
Mueller, Gerhard; Doerfel, Helmut; and Schmidt-Thomee, Georg. Molding material from polyamide and acrylic ester of a t-aliphatic alcohol. 3,700,751, Cl. 260-857.
Mueller, Kurt F., to United States of America, Navy. Liquid bipropellant system using aqueous hydroxylammonium perchlorate oxidizer. 3,700,393, Cl. 60-214.000.
Mugnier, Michel: *See—*
Gassmann, Hans Ulrich; and Mugnier, Michel, 3,699,804.
Muhler, Joseph C.; and Stookey, George K., to Indiana University Foundation. Impregnated article for cleaning the interproximal surfaces of the teeth. 3,699,979, Cl. 132-89.000.
Muhlmann, Christa: *See—*
Gentsch, Erich; Bederke, Klaus; Seider, Walter; Fullner, Hans Jurgen; and Muhlmann, Christa, 3,700,483.
Muller, Marcel: *See—*
Furst, Andor; Muller, Marcel; Muller, Peter; Schocher, Arne Johannes; and Bacher, Elisabeth, 3,700,702.
Muller, Peter: *See—*
Furst, Andor; Muller, Marcel; Muller, Peter; Schocher, Arne Johannes; and Bacher, Elisabeth, 3,700,702.
Multiculp Automation Company: *See—*
Ehe, Albert L., 3,700,530.
Munch, Otto R., to Johnson Service Company. Supply connection means for bleed type sensing apparatus. 3,699,991, Cl. 137-82.000.
Munson, Robert D., to Emerson Electric Co. Control circuit for mercury arc lamps. 3,700,962, Cl. 315-241.000.
Murakami, Masuo; Inukai, Noriyoshi; Koda, Akio; and Nakano, Koji, to Yamanouchi Pharmaceutical Co., Ltd. Processes for the preparation of N-(diethylaminoethyl) -4-amino-5-chloro-2-methoxybenzamide. 3,700,719, Cl. 260-471.00r.
Murakami, Yoshio: *See—*
Yasuda, Nobuaki; Ogawa, Takenobu; Murakami, Yoshio; Higashinakagawa, Iwao; Takeno, Syozo; and Tanaka, Norio, 3,699,619.
Murashige, Robert H., to Memorex Corporation. Vesicular film. 3,700,480, Cl. 117-34.000.
Murgas, Karl M.; Greenberg, Burton; and Clark, Otto A., to ICP, Inc. Switch control means for a photocopy machine. 3,700,326, Cl. 355-14.000.
Murgas, Karl M.; and Greenbert, Burton, to ICP, Inc. Switch control means for an electrostatic book copier machine. 3,700,327, Cl. 355-14.000.
Murray, Lawrence Aloysius, to RCA Corporation. Method of making complementary insulated gate field effect transistors. 3,700,507, Cl. 148-187.000.
Murray, Robert William, to American Cyanamid Company. Flame-retarded polymer compositions. 3,700,626, Cl. 260-45.80r.
Murray, Russell; and Gignoux, Dominique, to Columbia Research Corporation. Method for detecting pinhole defects in foil material. 3,700,909, Cl. 250-219.0df.
Murthy, Nanjundiah N., to Pitney Bowes-Alpex, Inc. Data processing system employing particular bar code configuration. 3,700,858, Cl. 235-61.11e.
Myer, Jon H.; O'Mera, Thomas R.; and Richardson, John M., to Hughes Aircraft Company. Code reading system for identification of moving and stationary objects utilizing noncoherent optics. 3,700,907, Cl. 250-219.00d.
Myers, James E., to Clark Equipment Company. Adjustable shelf support bracket. 3,700,114, Cl. 211-150.000.
Myers-Sherman Company: *See—*
Shaddock, Roland E., 3,700,360.
Nachbur, Hermann; and Maeder, Arthur, to Ciba-Geigy A.G. Process for flameproofing cellulose-containing fibrous materials. 3,700,403, Cl. 8-115.600.
Nacht, George G., to United States of America, Navy. Walsh function generator. 3,701,143, Cl. 340-347.0dd.
Nadon, Donald J. Inductively coupled grid cursor. 3,700,809, Cl. 178-87.000.
Nagai, Katsumi: *See—*
Kurokawa, Toshio; Nishiyama, Shoji; Nagai, Katsumi; and Mochizuki, Yuu, 3,700,229.
Nagao, Morimasa, to Nippon Electric Company, Limited. Magnetic head including thin magnetic film separated by a gap spacer. 3,700,827, Cl. 179-100.20c.
Nagata, Minoru: *See—*
Masuhara, Toshiaki; Nagata, Minoru; and Kubo, Masaharu, 3,700,981.
Nagata, Shojiro: *See—*
Yamaguchi, Yukiya; Fukushima, Kunihiko; Yasuda, Minoru; and Nagata, Shojiro, 3,701,095.
Nagatsu, Junsaku: *See—*
Suzuki, Saburo; Isono, Kiyoshi; Nagatsu, Junsaku; Akashiba, Takeo; and Sasaki, Shigeki, 3,700,655.
Nagel, Horstmar; Berg, Markus; Lohr, Albrecht; and Adler, Wilfried, to Henkel & Cie G.m.b.H. Process of preparing pulverulent to granular perborate containing washing composition. 3,700,600, Cl. 252-99.000.
Naito, Fumio; Kudo, Toshiyuki; and Kubosaki, Masanobu, to Sanyo Electric Co., Ltd. Piezoelectric ceramic compositions. 3,700,596, Cl. 252-62.900.
Najjar, Hann F.: *See—*
Blasbalg, Herman L.; Hayase, Joshua Y.; Crutchfield, Richard C., Jr.; and Najjar, Hann F., 3,700,820.
Nakaguchi, Kohei; Kawasumi, Shohachi; Hirooka, Masaaki; and Yabuuchi, Hiroshi. Alternating copolymers of alpha-olefins and acrylic compounds. 3,700,647, Cl. 260-63.00r.
Nakamura, Keiji: *See—*
Kaneko, Hidehiko; Aritomi, Jiro; and Nakamura, Keiji, 3,700,680.
Nakano, Koji: *See—*
Murakami, Masuo; Inukai, Noriyoshi; Koda, Akio; and Nakano, Koji, 3,700,719.
Nakashima, Shinichi: *See—*
Mizuno, Hiroyuki; Nakashima, Shinichi; and Miyai, Yukio, 3,701,050.
Nakashio, Seizo: *See—*
Hamada, Takaki; Nakashio, Seizo; Maruta, Isao; Hayatsu, Kazuo; Seto, Tetsuki; and Kono, Yoichi, 3,700,630.
Nakayama, Kiyoshi; Tanaka, Haruo; and Hagino, Hiroshi, to Kyowa Hakko Kogyo Co., Ltd. Process for producing L-lysine by fermentation. 3,700,557, Cl. 195-29.000.
Nakazawa, Junichi: *See—*
Soma, Nobuo; Watatani, Mitsuo; Nakazawa, Junichi; Sato, Yoshio; Kuwabara, Yoshimi; and Ishikawa, Hidehiko, 3,700,682.
Nalco Chemical Company: *See—*
Domba, Elemer, 3,700,844.
Hyde, James A., 3,700,587.
Nalco Manufacturing Company, Inc.: *See—*
Walter, George, 3,700,011.
Nalevanko, Richard N.: *See—*

Hubbard, Ronald R.; and Nalevanko, Richard N., 3,700,185.

Nanne, Silvio Edward; and Moody, Renville O., to Algoma Steel Corporation, The. Universal tap jack. 3,700,347, Cl. 408-236.000.

Nannini, Norando. Golfer's wrist attachment. 3,700,245, Cl. 273-189.00a.

Nasu, Jiro; Ogawa, Tokuo; and Sekine, Yoshio, to Toyota Jidosha Hanbai Kabushiki Kaisha. Friction disc clutch for vehicles. 3,700,084, Cl. 192-70.280.

Nation, John A., to United States of America, Navy. High power pulsed microwave source. 3,700,952, Cl. 315-3.500.

National Aeronautics andSpacadnistration with: *See—*
Low, George M, Deputy Administrator of the; National Aeronautics andSpacadnistration with; respect to an invention of; Fymat, Alain L; and Abhyankar, Krishna D India, 3,700,334.

National Cash Register Company, The: *See—*
Cartmell, James V.; Churchill, Donald; and Koopman, Donald E., 3,700,306.
O'Connor, James E., 3,701,118.
Phillips, Paul S., Jr., 3,700,439.

National Distillers and Chemical Corporation: *See—*
Quackenbush, John J., 3,700,367.

National Research Development Corporation: *See—*
Brindley, Giles Skey; and Donaldson, Peter Eden Kirwan, 3,699,970.
Clifton, John Stephen; and Parker, Dawood, 3,700,578.
Clifton, John Stephen; and Parker, Dawood, 3,700,579.
Macleod, Norman; and Proctor, David, 3,700,580.
Maynard, Douglas Edward, 3,699,947.

National Tool & Die Corporation: *See—*
Deeke, Heinrich E., 3,700,381.

Naydan, Theodore T.; and Aker, Walter W., to Environment/One Corporation. Process and apparatus for the production of hydroelectric pulsed liquids jets. 3,700,169, Cl. 239-4.000.

Naylor, David C.; and Leyburn, Derek, to Bell Canada. Automatic call through test set. 3,700,830, Cl. 179-175.20r.

Negra, John S.: *See—*
Tourtellotte, John F.; Negra, John S.; Warshaw, Abe; and Villiers-Fisher, John F., 3,699,683.

Nelkin, Arthur; and Whittaker, Robert H., to Westinghouse Electric Corporation. Apparatus for laying underground cable. 3,699,693, Cl. 61-72.600.

Nelson, Howard N., to Kimberly-Clark Corporation. Method of dispensing interfolded sheet material and package therefor. 3,700,138, Cl. 221-51.000.

Nelson, Terence John: *See—*
Bonyhard, Peter Istvan; and Nelson, Terence John, 3,701,132.
Geusic, Joseph Edward; Nelson, Terence John; and Schinke, David Paul, 3,701,122.

Nepereny, Harold A.; and Reich, John P., to Koening, A. G., mesne. Air pollution control apparatus. 3,699,750, Cl. 55-288.000.

Newby, Kenneth Russ: *See—*
Butherus, Alexander Duane; and Newby, Kenneth Russ, 3,700,975.

Newby, Kenneth Russ; and Turner, Dennis Robert, to Bell Telephone Laboratories, Inc. Method of metallizing devices. 3,700,569, Cl. 204-15.000.

Newman, Bruce D.: *See—*
Richardson, Harold; and Newman, Bruce D., 3,700,064.

Niall, Hugh D.: *See—*
Tregear, Geoffrey W.; Battaerd, Hendrik A. J.; Lang, Gunter A.; Catt, Kevin; and Niall, Hugh D., 3,700,609.

Nichols, Charles M. Valve apparatus including self-installing mechanism. 3,699,996, Cl. 137-318.000.

Nickerson, Ralph F.; and Weymouth, Harold D., to Monsanto Company. Polyvinyl alcohol-glyoxal-polyol adhesive composition. 3,700,611, Cl. 260-17.00r.

Nicolai, Van O. Light polarizing prism of zircon. 3,700,308, Cl. 350-157.000.

Nicolaides, Ernest D., to Parke, Davis & Company. Phenylalanine derivatives for treatment of measles infections. 3,700,770, Cl. 424-177.000.

Nicolon N.V.: *See—*
De Winter, Jan Gerrit, 3,699,686.

Nielsen, Anker J., Jr. Positive locking terminal bushings for flexible pipe. 3,700,268, Cl. 285-55.000.

Niemann, Theodore F., to Goodrich, B. F., Company, The. Catalytic block copolymerization of polar monomers. 3,700,756, Cl. 260-881.000.

Niemoller, Arthur B.: *See—*
Wilson, John R.; and Niemoller, Arthur B., 3,700,840.

Niepenberg, Horst; Oppenberg, Rolf; and Kuhn, Rudolf, to Deutsche Babcock & Wilcox Aktiengesellschaft. Oil burner. 3,700,376, Cl. 431-13.000.

Nihon Denshi Kabushiki Kaisha: *See—*
Ota, Tomiyoshi; Takigawa, Katunobu; and Honda, Masasada, 3,699,948.

Nikko Pen Kabushiki Kaisha: *See—*
Terasaki, Shingan, 3,700,340.

Nilsen Mfg. Co.: *See—*
Stobbe, Richard P.; and Knapp, Richard V., 3,700,904.

Nilssen, Ole K., to Motorola, Inc. Isolator washer means for pushbutton tuner memory mechanism. 3,699,817, Cl. 74-10.370.

Nilsson, Sven Walter, to SKF Industrial Trading and Development Company N.V. Device for re-circulating the balls of a ball screw mechanism. 3,699,823, Cl. 74-459.000.

Nippon Denso Kabushiki Kaisha, and: *See—*
Shirai, Takeaki; Sakakibara, Shigeru; Noguchi, Masaaki; and Sumiyoshi, Masharu, 3,700,079.

Nippon Electric Co., Ltd.: *See—*
Watanabe, Takeshi; and Saito, Yuzi, 3,700,949.

Nippon Electric Company, Limited: *See—*
Nagao, Morimasa, 3,700,827.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Tomisawa, Norio, 3,700,783.
Uchiyama, Yasuji, 3,700,782.

Nippon Hoso Kyokai: *See—*
Yamaguchi, Yukiya; Fukushima, Kunihiko; Yasuda, Minoru; and Nagata, Shojiro, 3,701,095.

Nippon Kogaku K.K.: *See—*
Fujii, Tatsuo; and Tomomitsu, Toshio, 3,700,337.
Shimomura, Jun, 3,699,864.
Shimomura, Jun, 3,699,868.

Nippon Steel Corporation: *See—*
Tanaka, Osamu; and Matsumoto, Fumio, 3,700,506.

Nishikawa Rubber Co., Ltd.: *See—*
Kimura, Yoh, 3,699,718.

Nishino, Tsutomu: *See—*
Morita, Yasuyuki; and Nishino, Tsutomu, 3,700,322.

Nishiyama, Shoji: *See—*
Kurokawa, Toshio; Nishiyama, Shoji; Nagai, Katsumi; and Mochizuki, Yuu, 3,700,229.

Nissan Kagaku Kogyo Kabushiki Kaisha: *See—*
Kokubo, Ryo; Takakuwa, Yasuo; Shiroishi, Akihiro; and Kihara, Mitsuji, 3,700,672.

Nissan Motor Company, Limited: *See—*
Mohri, Yohichi, 3,699,994.

Nixon, Dalbro R.: *See—*
Batchelor, Gordon S.; and Nixon, Dalbro R., 3,700,200.

Noble Manufacturning Company: *See—*
Sosalla, Harry; Meusburger, Lyle M.; and Jarnagin, Max L., 3,700,040.

Noble, Philip S.; and Chapin, James R., to General Electric Company. Intermodal transfer system. 3,700,128, Cl. 214-40.000.

Noda, Hideyo: *See—*
Noda, Masajiro; Kajita, Hiroyuki; and Kuwayama, Koji, 3,700,402.

Noda, Masajiro; deceased (by Noda, Hideyo; heir); Kajita, Hiroyuki; and Kuwayama, Koji, to Meisei Chemical Works, Ltd. Resist printing under reactive dye with alkali hydroxy methane sulfonate or amino and amido methane sulfonate. 3,700,402, Cl. 8-65.000.

Noguchi, Masaaki: *See—*
Shirai, Takeaki; Sakakibara, Shigeru; Noguchi, Masaaki; and Sumiyoshi, Masharu, 3,700,079.

Nolan, Matthew P. Cargo bulkhead. 3,699,898, Cl. 105-376.000.

Nolting, Peter, to Vereinigte Aluminium-Werke Aktiengesellschaft. Melting furnace. 3,700,224, Cl. 266-33.000.

Noranda Mines Limited: *See—*
Themelis, Nickolas J.; and Tarassoff, Peter, 3,700,431.

Nordin, Ivan C. Tetrahydropyrazolodiazepinone compounds and methods for their production. 3,700,657, Cl. 260-239.30b.

Nordt, Egon: *See—*
Bienert, Klaus; Lang, Winfried; Nordt, Egon; and Weidner, Herbert, 3,700,413.

Noren, Don W., to Noren Products, Inc. Heat pipes. 3,700,028, Cl. 165-32.000.

Noren Products, Inc.: *See—*
Noren, Don W., 3,700,028.

Norian, Roger F.: *See—*
Shuey, David R.; and Norian, Roger F., 3,700,990.

Norman, Richard R., 50% to Bressickello, Tony J. Atomatic bag packing apparatus for check-out. 3,699,741, Cl. 53-29.000.

North American Rockwell Corporation: *See—*
Amato, Richard A., 3,699,765.
Archambault, Roger J., 3,699,766.
Chabot, Leo L., 3,699,760.
Denigan, Thomas R.; and Thomas, James L., 3,699,839.
Easoz, Robert D., 3,699,888.
Molnar, Laszlo A., 3,700,784.
Rouse, William H., 3,700,984.

North, James Clayton; and Pruniaux, Bernard Roger, to Bell Telephone Laboratories, Incorporated. Field effect transistors and methods for making field effect transistors. 3,700,978, Cl. 317-235.00r.

Northern Electric Company, Limited: *See—*
Chulak, William, 3,700,823.
Ingrey, Sidney Ivor Joseph, 3,701,115.

Northern Illinois Gas Company: *See—*
Dufour, Raymond J.; and Grimm, James J., 3,700,265.

Novajovsky, William A.; and Hoelscher, Max W., to United States of America, Atomic Energy Commission. Radio-frequency window assembly having shielded solder joints and reweldable replacement flanges. 3,701,061, Cl. 333-98.00p.

Novakovsky, Vladimir Efimovich: *See—*
Vagin, Alexei Alexeevich; Yablonsky, Stanislav Valerievich; Voloshin, Petr Stepanovich; Sharov, Nikolai Grigorievich; Shiborin, Viktor Ivanovich; Novakovsky, Vladimir Efimovich; Kolpakov, Grigory Vasilievich; Ivanov, Mark Efremovich; Lindin, Viktor Mikhailvich; and Lipsky, Daniil Yakovlevich, 3,700,364.

Nowick, Raymond M. Automobile carburator air intake filters. 3,699,749, Cl. 55-274.000.
Nttco Corporation: *See—*
Lennon, ohnJ. Winchester, ass., 3,700,294.
Nu-Lite Fluorescent Mfg. Co., Inc.: *See—*
Marx, George M., 3,700,887.
Nuckel, Norbert, to Kocks, Friedrich. Wire and rod handling apparatus. 3,699,880, Cl. 100-7.000.
N.V. Bekaert S.A.: *See—*
Tournoy, Willy, 3,699,797.
Nyswander, Reuben E., to United States of America, Navy. Remote controlled, adjustable bandwidth low pass filter. 3,701,059, Cl. 333-70.00a.
Oakland Plastics Corporation: *See—*
Cook, James M., III, 3,699,901.
Obayashi, Nobuharu, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument. 3,700,781, Cl. 84-1.010.
O'Connor, James E., to National Cash Register Company, The. Optical storage medium and method of making and using. 3,701,118, Cl. 340-173.0ls.
O'Connor, Ward F.; and Van Vliet, William George, to Lummus Company, The. Feedback control apparatus. 3,699,989, Cl. 137-487.500.
Odman, Tor Axel: *See—*
Westberg, Bengt Karl-Axel; Odman, Tor Axel; and Fahlstrom, Rune, 3,699,878.
O'Donnell, Thomas P. Floor mat portionally with a fenced in top surface and an opening therethrough. 3,700,201, Cl. 248-346.000.
O'Driscoll, Kenneth F.; and Isen, Allan A., to Griffin Laboratories Incorporated. Fabrication of soft plastic contact lens blank. 3,700,761, Cl. 264-1.000.
Oetiker, Hans. Foldable bed structure. 3,699,593, Cl. 5-66.000.
of: *See—*
Fletcher, James C., Administrator of The National; Aeronautics and Space Administration with respect; to an invention of; List, William F.; and Farnsworth, David L., 3,700,961.
Low, George M, Deputy Administrator of the; National Aeronautics andSpacadnistration with; respect to an invention of; Fymat, Alain L; and Abhyankar, Krishna D India, 3,700,334.
Offermanns, Heribert: *See—*
Asinger, Friedrich; Offermanns, Heribert; and Ghyczy, Mikols, 3,700,683.
Ogawa, Takenobu: *See—*
Yasuda, Nobuaki; Ogawa, Takenobu; Murakami, Yoshio; Higashinakagawa, Iwao; Takeno, Syozo; and Tanaka, Norio, 3,699,619.
Ogawa, Tokuo: *See—*
Nasu, Jiro; Ogawa, Tokuo; and Sekine, Yoshio, 3,700,084.
Ogiso, Mitsutoshi; and Ohtaki, Shohei, to Canon Kabushiki Kaisha. Camera equipped with auto-flash device. 3,699,858, Cl. 95-10.0cd.
Ogura, Isamu: *See—*
Sato, Kiichi; and Ogura, Isamu, 3,699,648.
O'Hanlon, James F., Jr.; and Sanderson, Glenn A., to Haman Factors Research Incorporated. Pulse jitter measurement especially for agart beat measurement. 3,699,949, Cl. 128-2.60a.
O'Hara, Genevieve M.: *See—*
Tobias, John D., 3,700,004.
O'Hara, John P., Jr.: *See—*
Tobias, John D., 3,700,004.
Ohio Medical College, The: *See—*
Manning, Maurice, 3,700,652.
Ohio Moulding Corporation, The: *See—*
Montean, John, Jr., 3,700,277.
Ohmori, Koichiro, to Honshu Paper Company. Method for manufacturing a composite corrugated paper board. 3,700,518, Cl. 156-152.000.
Ohshima, Kotaro: *See—*
Abe, Isao; Hirose, Tatsuo; and Ohshima, Kotaro, 3,699,976.
Ohtaki, Shohei: *See—*
Ogiso, Mitsutoshi; and Ohtaki, Shohei, 3,699,858.
Oki Electric Industry Company Limited: *See—*
Sato, Kiichi; and Ogura, Isamu (said Ogura assor. to), 3,699,648.
Okinaka, Uutaka, to Bell Telephone Laboratories, Incorporated. Electroless gold plating baths. 3,700,469, Cl. 106-1.000.
Okumura, Takuzo: *See—*
Yamanouchi, Saburo; Yasuno, Kiyoshi; Yamatokohriyama, Kou Sota; and Okumura, Takuzo, 3,700,750.
Okura, Yukio: *See—*
Adachi, Toshio; Hayashi, Kiyohide; and Okura, Yukio, 3,700,026.
Olin Corporation: *See—*
Schultes, Hermann, 3,700,252.
Olivares, Ismael A.: *See—*
Gabrielsen, Rolf S.; and Olivares, Ismael A., 3,700,442.
Olofsson, Nils Gunnar: *See—*
Schullstrom, Sten Gunde; Freijd, Ingvar; Schader, Arne; and Olofsson, Nils Gunnar, 3,701,075.
Olympia Werke AG: *See—*
Kunst, Detlef, 3,700,088.
O'Mera, Thomas R.: *See—*
Myer, Jon H.; O'Mera, Thomas R.; and Richardson, John M., 3,700,907.
Omron Tateisi Electronics Co.: *See—*
Koga, Hirohumi; and Sato, Ryuichi, 3,701,062.
O'Neal, Donald V. Multi-track adapter cartridge adapter unit for multi-track cartridge type magnetic tape player. 3,700,826, Cl. 179-100.20z.
O'Neil, Paul F.: *See—*
Zawadzki, Thomas, 3,700,616.
Onstott, Edward D. Sextant clock. 3,699,761, Cl. 58-2.000.
Oppenberg, Rolf: *See—*
Niepenberg, Horst; Oppenberg, Rolf; and Kuhn, Rudolf, 3,700,376.
Oppermann, Robert A. Enzymatic production of catechol from phenol. 3,700,560, Cl. 195-49.000.
Optisonics Corporation: *See—*
Gallina, Harold, 3,700,319.
Oren, Ida: *See—*
Zabicky-Zissman, Jacobo Zelik; Oren, Ida; and Katchalski, Ephraim, 3,700,610.
Ort, Morris R.: *See—*
Mottus, Edward H.; and Ort, Morris R., 3,700,710.
Orth, Charles D., to Controls Company of America. Thermal expansion valve with rapid pressure equalizer. 3,699,778, Cl. 62-225.900.
Ortolano, Ralph J., to Westinghouse Electric Corporation. Rotor structure and method of broaching the same. 3,700,353, Cl. 416-199.000.
Oshima, Takao: *See—*
Ueno, Katsuji; and Oshima, Takao, 3,700,608.
Oster, Claude. Grounding receptacle. 3,701,074, Cl. 339-14.00r.
Ostrozynski, Robert Leopold, to Union Carbide Corporation. Process for preparing silicon peroxide compounds. 3,700,712, Cl. 260-448.20e.
Oswitch, Stanley: *See—*
Golownia, Robert F.; and Oswitch, Stanley, 3,700,617.
Ota, Masami: *See—*
Ishikawa, Tatsuo; Hiruta, Shiro; Wakabayashi, Teruomi; Inamoto, Yoshihiko; Tetsuhiro, Kusunose; Isumaki, Tatsuichi; and Ota, Masami, 3,700,662.
Ota, Tomiyoshi; Takigawa, Katunobu; and Honda, Masasada, to Nihon Denshi Kabushiki Kaisha. Recording device with automatic gain range changer and DC correction means. 3,699,948, Cl. 128-2.06g.
Owens, William A., to Cincinnati Milacron Inc. Apparatus for securing and aligning two elements with respect to each other in orthogonal planes. 3,700,292, Cl. 308-3.00a.
Owens-Corning Fiberglas Corporation: *See—*
Pearson, Lee E.; and Clark, Jeri O., 3,700,512.
Owens-Illinois, Inc.: *See—*
Allgeyer, Guy H.; and Foote, James B., 3,699,902.
Grier, John D., 3,700,436.
Ozawa, Syuichi; and Tomimura, Noboru, to Iwasaki Tsushinki Kabushiki Kaisha (a/k/a Iwatsu Electric Co., Ltd.). Resistive film bleeder resistor for use in a branch circuit. 3,701,056, Cl. 333-8.000.
Pabst Brewing Company: *See—*
Ziffer, Jack, 3,700,561.
Pacak, Matthew, to Eaton Yale & Towne, Inc. Method and apparatus for making grooved wheels. 3,700,382, Cl. 29-159.00r.
Padawer, Jacques: *See—*
Widmark, Rudolph M.; Lichtenstein, Bernard; Paseltiner, Lynn; and Padawer, Jacques, 3,700,555.
Padgett, William J.; and Wison, Donald A., to Warwick Electronics, Inc. Remote control receiver using a phase locked loop. 3,701,103, Cl. 340-170.000.
Pagani, Hermes: *See—*
Thiemann, Josef Ernst; and Pagani, Hermes, 3,700,558.
Page, Patrick E. Parasail, glider type aerial device. 3,700,191, Cl. 244-16.000.
Paget, George Edward: *See—*
Richardson, Dora Nellie; Walpole, Arthur Leonard; and Paget, George Edward, 3,700,777.
Pahlow, Lothar, to Wilhelmsburger Maschinenfabrik, Firma. Adjustable supporting structure for power tools or the like. 3,700,195, Cl. 248-16.000.
Painton, Claude Arthur, to United Gas Industries Limited, mesne. Illuminating display for simulating a fire. 3,699,697, Cl. 40-106.530.
Palac, Kazimir, to Motorola, Inc. Edge-bonded bi-metallic strip extending from metal plate on shadow mask to stud via spring of substantially smaller cross-sectional area. 3,700,948, Cl. 313-85.00s.
Palmer, Harold D.: *See—*
Hood, Jesse C., Jr.; and Palmer, Harold D., 3,699,629.
Paoli, Thomas Lee; and Ripper, Jose Ellis, to Bell Telephone Laboratories, Inc. Optical coupling of adjacent stripe contact geometry semiconductor lasers. 3,701,044, Cl. 331-94.500.
Papadopoulos, Stelios B.: *See—*
Helms, Clifford J.; McMillan, Norman; and Papadopoulos, Stelios B., 3,700,855.
Papadopouos, Michael N.; and Ueber, Russell C., to Shell Oil Company. Method of producing oil from an oil shalf formation containing nahcolite and dawsonite. 3,700,280, Cl. 299-5.000.
Papst, Georg F.; Gierschek, Emil; and Papst, Hans-Dieter, to Papst-Motoren KG. Fan assembly for a ventilator. 3,700,358, Cl. 417-354.000.
Papst, Hans-Dieter: *See—*
Papst, Georg F.; Gierschek, Emil; and Papst, Hans-Dieter, 3,700,358.
Papst-Motoren KG: *See—*
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Paquin, Leon J.: *See—*

Violette, Glenn M.; Paquin, Leon J.; and Lock, James A., 3,700,525.
Parilla, Arthur R. Cooling techniques for high temperature engines and other components. 3,700,171, Cl. 239-127.300.
Park, Vernon K.: *See*—
Johnson, Sam H., Jr.; Mears, Robert A.; and Park, Vernon K., 3,700,758.
Parke, Davis & Company: *See*—
Nicolaides, Ernest D., 3,700,770.
Parker, Dawood: *See*—
Clifton, John Stephen; and Parker, Dawood, 3,700,578.
Clifton, John Stephen; and Parker, Dawood, 3,700,579.
Parker, William J.: *See*—
Rausch, John T.; and Parker, William J., 3,700,069.
Parkin, William J.; and Wilson, Joe C., Jr., to Sanders Associates, Inc., mesne. Multiple element sensing apparatus. 3,700,905, Cl. 250-203.00r.
Parkinson, Gerald W.; and Cutting, Jack R., to United Aircraft Corporation. Trim reference for helicopter feel augmentation system. 3,700,995, Cl. 318-628.000.
Parks, Charles F., to Air Reduction Company, Inc. Electroconductive glaze and method for preparation. 3,700,606, Cl. 252-518.000.
Parmelee, Kendall G.: *See*—
Chelminski, Stephen V., 3,699,771.
Parouty, Jran Claude: *See*—
Bidault, Michel; Dosdat, Jean; Lelay, Roland; and Parouty, Jran Claude, 3,699,647.
Parr, Michael K. Vibratory feeder bowl drive apparatus. 3,700,094, Cl. 198-220.0bc.
Parry, John, to Ingenious Devices Limited. Apparatus for providing oil grooves in valve guides. 3,700,343, Cl. 408-81.000.
Parson, Howard Grubb, Sir, & Company Limited: *See*—
Macleod, Hugh Angus McIntosh, 3,700,898.
Pascal, Forrest A., II.: *See*—
Paschal, Forrest A.; Stuart, Gerald L.; and Pascal, Forrest A., II., 3,700,274.
Paschal, Forrest A.; Stuart, Gerald L.; and Pascal, Forrest A., II., to Paschal, Forrest Machinery Company. Apparatus for stacking uncured brick. 3,700,274, Cl. 294-63.00r.
Paschal, Forrest Machinery Company: *See*—
Paschal, Forrest A.; Stuart, Gerald L.; and Pascal, Forrest A., II., 3,700,274.
Paseltiner, Lynn: *See*—
Widmark, Rudolph M.; Lichtenstein, Bernard; Paseltiner, Lynn; and Padawer, Jacques, 3,700,555.
Pass & Seymour, Inc.: *See*—
Bates, Reginald A., 3,700,972.
Patel, Jayantilal M.: *See*—
Lawrence, Benjamin; Wolfson, Alan B.; and Patel, Jayantilal M., 3,700,465.
Patel, Jayantilal M.; Wolfson, Alan B.; and Lawrence, Benjamin, to Procter and Gamble Company, The. Decaffeination process. 3,700,464, Cl. 99-70.000.
Paterick, Robert J.; Llana, Eugenio R.; and Kleman, Jerry L. Toy football. 3,700,239, Cl. 273-65.00r.
Patrick, Ralph E.: *See*—
Kovach, Stephen M.; Patrick, Ralph E.; and Kmecak, Ronald A., 3,700,745.
Patterson, Roger Lee; and Ventresca, Mario, to Deere & Company. Rear furrow wheel control structure for disc tillers and the like. 3,700,042, Cl. 172-385.000.
Patton, Terence R.; and Ringel, Melvin B., to United States of America, Navy. Frequency averaging controlled false alarm rate (CFAR) circuit. 3,701,149, Cl. 343-5.0dp.
Pawloski, Chester E.; and Stewart, Russell L., to Dow Chemical Company, The. Methylacetylene chlorination. 3,700,735, Cl. 260-597.00r.
Peacock, Peter J.: *See*—
Scarnato, Thomas J.; Peacock, Peter J.; and Kowalik, John J., 3,699,758.
Peak, Charles Benjamin, to Deere & Company. Quick-adjustable lower stop for feeder house drum. 3,699,753, Cl. 56-14.500.
Peale, Robert E. Adjustable axis work support. 3,700,228, Cl. 269-61.000.
Pearson, Alma: *See*—
Pearson, Reinhold A., 3,700,090.
Pearson, Kenneth William: *See*—
Dodman, David,; Pearson, Kenneth William; and Woolley, John Mathers, 3,700,605.
Pearson, Lee E.; and Clark, Jeri O., to Owens-Corning Fiberglas Corporation. Method of forming a fluid retaining wall. 3,700,512, Cl. 156-62.400.
Pearson, R. A., Company: *See*—
Pearson, Reinhold A., 3,700,090.
Pearson, Reinhold A.; deceased (by Pearson, Alma; executrix), to Pearson, R. A., Company. Conveyor and article handling apparatus. 3,700,090, Cl. 198-34.000.
Pearson, William S., to Cypro-Incorporated. Comminuting apparatus. 3,700,177, Cl. 241-36.000.
Peltret, Pierre Henri, to C.A.V. Limited. Governor mechanisms. 3,699,816, Cl. 73-526.000.
Pennwalt Corporation: *See*—
Miller, Henry C., 3,700,627.
Taylor, Larry Christopher, 3,699,781.
Zambone, Albert S., 3,700,704.
Zambone, Albert S., 3,700,705.
Perilstein, Warren L.: *See*—
Plonsker, Larry; Perilstein, Warren L.; and Malec, Robert E., 3,700,598.
Perkins-Elmer Corporation: *See*—
Rayces, Juan L., 3,700,310.
Perlman, Marvin: *See*—
United States of America, National Aeronautics and Space Administration, 3,700,869.
Permalok International, Inc.: *See*—
Holly, James A., 3,699,978.
Perminov, Evgeny Mikhailovich, to Minsky opytny zavod Spetsialnogo Konstruktoskogo Bjuro No. 3. Dividing attachment. 3,699,844, Cl. 90-57.000.
Pernet, Michel, to Erste Deutsche Floatglas GmbH & Co. Weir-like body extending from below into a body of moving molten glass. 3,700,424, Cl. 65-333.000.
Persin, William J., to Baychem Corporation, mesne. Tread member and endless tracks made therefrom. 3,700,287, Cl. 305-38.000.
Peter, Alfred O., to FMC Corporation. Truck tow conveyor switching apparatus. 3,699,895, Cl. 104-88.000.
Peters, Arnis E., to Micro 8 Company, mesne. Microfilm viewer. 3,700,321, Cl. 353-26.000.
Peters, Theodore Richmond, to Bell Telephone Laboratories, Incorporated. Priority access system. 3,701,109, Cl. 340-172.500.
Petersen, Ulrich, to Mannesmann Aktiengesellschaft. Continuous casting machine. 3,700,027, Cl. 164-282.000.
Peterson, George Earl: *See*—
Glass, Alastair Malcolm; and Peterson, George Earl, 3,700,912.
Petite, Anthony M.; and Thornley, Clive E., to Ciba-Geigy Corporation. Dyeing of polycarbonamides of bis (paraamino-cyclohexyl) methane and dodecandioic acid with anionic dyes. 3,700,405, Cl. 8-173.000.
Petrolite Corporation: *See*—
Lissant, Kenneth J., 3,700,594.
Petry, Robert C., to Rohm & Haas Company. Bis(difluoramino)alkyl substituted compounds an method of preparation. 3,700,708, Cl. 260-453.0al.
Pettazzi, Paolo, to RIV-SKF Officine de Villar Petosa S.p.. Process and apparatus for correcting irregularities in the circularity of rings. 3,699,792, Cl. 72-110.000.
Pettitt, Malcolm Jack: *See*—
Taplin, Stanley Donovan; and Pettitt, Malcolm Jack, 3,700,825.
Peursem, Marvin Van, to Koehring Company. Resiliently mounted auger mechanism. 3,700,179, Cl. 241-301.000.
Pfadenhauer, Dieter: *See*—
Forsting, Bernard; Hellriegel, Edmund; and Pfadenhauer, Dieter, 3,700,076.
Pfizer, Inc.: *See*—
Barth, Wayne E., 3,700,681.
Philco-Ford Corporation: *See*—
Irvin, Albert H., 3,699,873.
Kaufman, Warren F., 3,699,814.
Philippi, Charles W. Balancing skill game. 3,700,234, Cl. 273-1.00m.
Phillips, Chandler A.: *See*—
Stevens, Curtis E.; and Phillips, Chandler A., 3,701,136.
Phillips, Paul S., Jr., to National Cash Register Company, The. Photocopy process utilizing a transfer sheet coated with microcapsules containing photosensitive Michler's ketone dye-precursors. 3,700,439, Cl. 96-27.0tr.
Phillips Petroleum Company: *See*—
Bellinger, Robert M.; and Cabbage, John T., 3,700,566.
Brady, Donnie G.; Zuech, Ernest A.; and Gray, Roy A., 3,700,625.
Brady, Donnie G., 3,700,724.
Hahn, William C., 3,699,821.
Piatek, Edward Walter; and Horr, William A., to Victaulic Company of America. Pipe groover. 3,699,828, Cl. 82-4.00c.
Picard, Clarence J.: *See*—
Garrahan, William F.; Madden, Edwin J.; and Picard, Clarence J., 3,699,959.
Pick, Steve J. Vehicle tilt indication apparatus. 3,701,093, Cl. 340-52.00h.
Pickett, John E. P. Method utilizing a disposable blade in microtome cutting. 3,699,830, Cl. 83-13.000.
Piegza, Henry John, to Welding and Steel Fabrication Co., Inc. Pivotal quick disconnect fluid flow coupling. 3,700,267, Cl. 285-24.000.
Pierce, Leo F.: *See*—
Moore, Peter N.; and Pierce, Leo F., 3,700,260.
Pierson, Charles W., to Eastman Kodak Company. Ultrasonic splicing. 3,700,532, Cl. 156-580.000.
Pike, Herbert J., to Stevens, J. P., & Co. Air yarn texturizer. 3,700,391, Cl. 57-77.300.
Pilling, Arthur F., to United States Steel Corporation. Work twister for rolling mill. 3,699,795, Cl. 72-231.000.
Pioneer Plastics, Inc.: *See*—
Blease, Wilfred J., 3,700,213.
Piper, Delbert A. Vibrating screen, earth-classifying motorcycle attachment. 3,700,105, Cl. 209-421.000.
Pipkins, David D., to Valspar Corporation, The. Method for keeping paint tanks clean. 3,699,982, Cl. 134-22.00r.
Piquerez, Ervin; deceased (by Scholler, Ami; and Bandelier, Edouard; executors). Tight control member for watch movement. 3,699,767, Cl. 58-90.00b.
Pitney Bowes-Alpex, Inc.: *See*—
Murthy, Nanjundiah N., 3,700,858.

Placente, Anthony N., to Congoleum Industries, Inc. Apparatus for producing resinous sheetlike products. 3,700,366, Cl. 425-71.000.
Planchon, Jean. Faceted reflector. 3,700,882, Cl. 240-41.360.
Plasser, Franz; and Theurer, Josef. Movable apparatus for replacing an old track by a new track. 3,699,894, Cl. 104-2.000.
Platzer, George E., Jr. Solid state relay arrangement. 3,700,923, Cl. 307-252.00b.
Pleasants, James E.; and Dereng, Viggo G., to United States of America, National Aeronautics and and Space Administration. Vortex breech high pressure gas generator. 3,700,192, Cl. 244-139.000.
Pleass, Charles M.: *See—*
Brandes, Raymond G.; and Pleass, Charles M., 3,700,857.
Plehal, Edward J., to Bissett-Berman Corporation, The. Electrolytic cell with inner electrode having non-reactive surface. 3,700,974, Cl. 317-230.000.
Plessey Handel und Investments AG: *See—*
Gwillim, David Thomas; and Whiting, Robin Joseph, 3,700,154.
Plonsker, Larry; Perilstein, Warren L.; and Malec, Robert E., to Ethyl Corporation. Fuel and lubricating oil compositions. 3,700,598, Cl. 252-50.000.
Plumat, Emile, to Glaverbel S.A. Application of metal coatings by the seizure method. 3,700,496, Cl. 117-211.000.
Plumb, John Beckett: *See—*
Atherton, John Heathcote; and Plumb, John Beckett, 3,700,713.
Polaroid Corporation: *See—*
Burgarella, John P.; and Ellin, Seymour, 3,699,861.
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Weed, Lucretia J., 3,700,441.
Wolbarst, John, 3,699,867.
Polit, Neil A.: *See—*
Hutner, Mark A.; Polit, Neil A.; Watson, Donald W; and Artelt, Herbert C., Jr., 3,700,324.
Polygon Concepts: *See—*
Souza, Augustine A., 3,700,137.
Pomey, Jacques, to Societe des Aciers Fins de l'Est. Method of treatment of liquid steel under vacuum. 3,700,779, Cl. 13-26.000.
Pontigny, Jacques A., to Coulter Electronics, Inc. Curve tracer. 3,700,991, Cl. 318-568.000.
Pontigny, Jacques A., to Coulter Electronics, Inc. Curve tracer. 3,700,992, Cl. 318-568.000.
Popeil Brothers, Inc.: *See—*
Popeil, Samuel J., 3,699,603.
Popeil, Samuel J., to Popeil Brothers, Inc. Wringer mop. 3,699,603, Cl. 15-120.00r.
Poplawski, Joel J.: *See—*
Bardos, John J.; and Poplawski, Joel J., 3,699,679.
Porsche, Dr.-Ing., H.c.F., K.G., Firma: *See—*
Grewing, Klaus; and Hacker, Fritz, 3,699,842.
Port-A-Stall: *See—*
Hero, Richard A., 3,699,924.
Porta Systems Corporation: *See—*
De Luca, Paul V., 3,700,824.
Porter, John Norman: *See—*
Kunstmann, Martin Paul; and Porter, John Norman, 3,700,768.
Martin, John Henry Edward James; and Porter, John Norman, 3,700,769.
Porter, Robert B.; Ardelt, Clarence A.; and Storck, Robert C., to International Harvester Company. Tractor inching control utilizing a decelerator. 3,700,081, Cl. 192-.070.
Posso, Pierre A. Boxes for packaging a reel. 3,700,098, Cl. 206-52.00f.
Potzick, Anthony J., to Mosler Safe Company, The. Dial structure for mechanism requiring both lineal and rotary input operating movements. 3,699,789, Cl. 70-329.000.
Powell, Gordon Francis Wellington; and Preston, Edward George, to Molins Machines Company Limited. Cigarette manufacture. 3,699,974, Cl. 131-21.00r.
PPG Industries, Inc.: *See—*
Davis, Harry P., 3,700,542.
Davis, Harry P., 3,700,543.
Preformed Line Products Company: *See—*
Minchak, Edward F., 3,699,592.
Prendergast, Charles Scott, to Cam Rotors Limited. Radial piston fluid pressure motor. 3,699,848, Cl. 91-487.000.
Press- und Stanzwerk Paul Craemer KG: *See—*
Ditges, Ernst, 3,700,205.
Preston, Edward George: *See—*
Powell, Gordon Francis Wellington; and Preston, Edward George, 3,699,974.
Price, John A.; and Stewart, Mary J., to FMC Corporation. Deep dyeable copolyester resins. 3,700,644, Cl. 260-75.00n.
Price, Robert H., to Control Data Corporation. Foil bearing control apparatus. 3,701,135, Cl. 340-174.10e.
Proce, H. C., Co.: *See—*
Elliott, Bernard V., 3,700,223.
Procter & Gamble Company, The: *See—*
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Procter and Gamble Company, The: *See—*
Bergeron, Robert J.; and Schlichter, Stephen L., 3,700,466.
Bolt, Gregory L.; and Strobel, Rudolf G. K., 3,700,463.
Lawrence, Benjamin; Wolfson, Alan B.; and Patel, Jayantilal M., 3,700,465.
Patel, Jayantilal M.; Wolfson, Alan B.; and Lawrence, Benjamin, 3,700,464.
Proctor, David: *See—*
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Protectowire Co., The: *See—*
Andrews, Clifton B., 3,701,141.
Pruniaux, Bernard Roger: *See—*
North, James Clayton; and Pruniaux, Bernard Roger, 3,700,978.
Pryjmak, Bohdan I., to General Motors Corporation. Speed Control system for alternating current induction motors. 3,700,988, Cl. 318-227.000.
Pufahl, Joseph. Laminated sheet material having a contoured surface. 3,700,539, Cl. 161-120.000.
Pulliam, Joseph H.; and McCurnin, Thomas W., to Iota Engineering, Inc. Fluid level sensor and system. 3,701,138, Cl. 340-244.00r.
Pullman Incorporated: *See—*
Shaver, William R.; and Schuller, James J., 3,700,143.
Putt, Frank E., to Town & Country Cleaners Franchises, Inc. Carpet cleaning apparatus. 3,699,607, Cl. 15-320.000.
Quackenbush, John J., to National Distillers and Chemical Corporation. Plastic bag flaring apparatus. 3,700,367, Cl. 425-112.000.
Rackson, Chester B. Hand held, finger controlled switch device. 3,700,835, Cl. 200-52.00r.
Rackson, Chester B. Hand held, finger controlled switch device with flexible wrist strap mount. 3,700,836, Cl. 200-52.00r.
Radiation Incorporated: *See—*
Davidson, Jimmy L.; and Rouse, George V., 3,699,722.
Raffali, Andre. Musical instruments, especially of the percussion type. 3,699,835, Cl. 84-236.000.
Rahn, Hilton N., Jr.: *See—*
Roberts, Carlton E.; Rahn, Hilton N., Jr.; and Reid, Walter E., Jr., 3,700,504.
Raisnn, Jean-Pierre: *See—*
Delair, Jean-Paul; Raisnn, Jean-Pierre; and Voisin, Eugene, 3,700,153.
Ralston, James C.: *See—*
Davidge, Ronald V.; Locklar, Henry C.; Ralston, James C.; and Ritchie, Robert T., 3,700,328.
Ramachandran, Sundaresan, to Allegheny Ludlum Steel Corporation. Method of controlling vacuum decarburization. 3,700,429, Cl. 75-49.000.
Rammler, Roland: *See—*
John, Willibald; Schmalfeld, Paul; Lange, Paul; and Rammler, Roland, 3,700,564.
Ramsley, Alvin O.; and Walwood, John T., to United States of America, Army. Camouflaged article and method of producing same. 3,700,397, Cl. 8-4.000.
Rannenberg, George C., to United Aircraft Corporation. Capacity control for gas turbine powered air cycle refrigeration system. 3,699,777, Cl. 62-172.000.
Ranon, Uri: *See—*
Zuleeg, Rainer; and Ranon, Uri, 3,701,043.
Ransburg Electro-Coating Corporation: *See—*
Ferrant, Wolfgang, 3,700,168.
Rausch, John T.; and Parker, William J., to General Motors Corporation. Wave interference silencer. 3,700,069, Cl. 181-36.00b.
Rauskolb, Fred W., to Standard International Corporation. Cooling system for heated calender rolls. 3,700,217, Cl. 263-6.00c.
Ravaschio, Guglielmo: *See—*
Basso, Eugenio; Ravaschio, Guglielmo; and Frangilli, Vittorio, 3,701,000.
Ravich, Leonard E.; Berman, Elliot; and Ekman, Carl F. W., said Ravich and said Ekman assor. to Itek Corporation. Production of positive image by developing an imagewise exposed semiconductor element with oxidizing and reducing agents. 3,700,447, Cl. 96-48000.
Raviv, Josef: *See—*.
Cocke, John; Mommens, Jacques H.; and Raviv, Josef, 3,701,111.
Loh, Louis S.; Monnens, Jacques H.; and Raviv, Josef, 3,701,108.
Rayces, Juan L., to Perkins-Elmer Corporation. Compact catadioptric apochromat system. 3,700,310, Cl. 350-201.000.
Raymond Lee Organization, Inc., The: *See—*
San Emetherio, Juan J., 3,700,240.
Raytheon Company: *See—*
Scheid, William J., 3,700,378.
Razzano, John S.; and Smith, Alfred H., to General Electric Company. Process for treating reinforcing silica filler. 3,700,473, Cl. 106-288.00q.
RCA Corporation: *See—*
Bosomworth, Douglas Robert, 3,700,791.
Caplan, Sandor; and Lamorte, Michael F., 3,701,047.
Craft, Jack, 3,701,022.
Epifano, Robert Nicholas; and Jordan, Eugene Leon, 3,700,497.
Haferl, Peter Eduard, 3,700,958.
Heyman, Philip Michael, 3,700,804.
Mirsch, John Walter, 3,701,065.
Murray, Lawrence Aloysius, 3,700,507.
Saxena, Arjun Nath, 3,700,979.
Steckler, Steven Alan, 3,701,032.
Warren, Henry Ray, 3,700,152.
Williams, John Garland, 3,701,107.
Read, Ronald G.: *See—*
Verge, Kenneth W.; Kachman, Robert D.; and Read, Ronald G., 3,700,362.
Reed, Howard D. Seam locator for sizing draperies. 3,699,674, Cl. 38-102.500.
Rees, Herbert, to Husky Manufacturing and Tool Works Ltd. Injection-molding machine with alarm device. 3,700,375, Cl. 425-422.000.

Regan, Ronald D.: *See—*
Abkowitz, Stanley; Siergiej, John M.; and Regan, Ronald D., 3,700,434.

Reich, John P.: *See—*
Nepereny, Harold A.; and Reich, John P., 3,699,750.

Reichhard, Robert W., to Honeywell Information Systems Inc. Static non-destructive single wall domain memory with hall voltage readout. 3,701,126, Cl. 235-174.0ha.

Reid, Philip L., to Grace, W. R., & Co. Package locator. 3,699,745, Cl. 53-393.000.

Reid, Walter E., Jr.: *See—*
Roberts, Carlton E.; Rahn, Hilton N., Jr.; and Reid, Walter E., Jr., 3,700,504.

Reifers, Richard F., to Diamond International Corporation. Food packaging tray. 3,700,096, Cl. 206-45.330.

Reimann, William George, to Litton Systems, Inc. Flatpack lead positioning device. 3,700,443, Cl. 96-36.200.

Reineman, Richard G.; and Schaefer, George E., to Brunswick Corporation. Two place seating unit. 3,700,279, Cl. 297-232.000.

Reliable Manufacturing Corporation: *See—*
Dusek, Ervin F., 3,699,874.

Reliance Electric Company: *See—*
Loshbough, Richard C., 3,701,106.

Relles, Howard M., to General Electric Company. Conversion of diacetylbenzenes to unsaturated derivatives. 3,700,743, Cl. 260-668.00r.

Rembaum, Alan, to California Institute of Technology. Heat detection and compositions and devices therefor. 3,700,603, Cl. 252-408.000.

Remers, William Alan; Gibs, Gabriel Joseph; and Weiss, Martin Joseph, to American Cyanamid Company. Certain 2-amino-1,3,4-thiadiazoles. 3,700,684, Cl. 260-306.80d.

Rencher, Joseph Lynn. Hand operated washing machine. 3,699,786, Cl. 68-144.000.

Rendek, Robert B.; and Binkerd, Evan F., to Armour & Company. System for continuous processing of vienna sausage using microwave energy. 3,700,847, Cl. 219-10.550.

Rendon, Daniel: *See—*
Deverse, Frank T.; Kurtz, John A.; Rendon, Daniel; Trahn, Kenneth A.; and Tuttle, James W., 3,699,917.

Republic Electronics Industries Corporation: *See—*
Biagi, Alvaro D.; and D'Amato, Sirio S., 3,701,011.

Research Corporation: *See—*
Dicke, Robert H., 3,700,895.

Resh, John S., to Honeywell Inc. Snap-in rigid lever actuating arrangement. 3,700,843, Cl. 200-172.00a.

Reuber, August. Ground wheel driven oscillating harrow. 3,700,036, Cl. 172-105.000.

Rex Chainbelt Inc.: *See—*
Butzow, Neil W.; and Harris, Bernard, 3,700,295.

Rex, Gert Ingmar, to AB Auto Industri. Novel automatic locking device for safety belts. 3,700,183, Cl. 242-107.400.

Rexham Corporation, mesne: *See—*
Johnson, Kenneth; and Lense, Robert F., 3,700,388.

Reynard, Kennard A.; and Rose, Swlwyn H., to Horizons Inc. Phosphonitrile elastomers. 3,700,629, Cl. 260-47.00p.

Reynolds, Christopher C., to Servo Corporation of America, mesne. Data storage and transfer apparatus for plural-vehicle identification system. 3,700,860, Cl. 235-61.11e.

Reynolds Metals Company: *See—*
Dill, Raymond Joseph, 3,700,571.

Reynolds, R. J., Tobacco Company: *See—*
Dickens, Alvin J., Jr., 3,700,461.

Rhee, Dong Woo, to GTE Sylvania Incorporated. Self-tracking noise suppressing circuit. 3,700,803, Cl. 178-7.30r.

Rhoton, Ronald L., to McDonnell Douglas Corporation. Cryogenic storage and expulsion means. 3,699,696, Cl. 62-45.000.

Ribas, Carlos Rodriguez. Mop wringer. 3,699,606, Cl. 15-261.000.

Rice, John A.; and Stewart, Mary J. Sulfophenoxy malonate compounds. 3,700,721, Cl. 260-470.000.

Rich, John Parker; and Carlsmith, Lawrence Allan, to Improved Machinery, Inc. Apparatus and methods of continuous digesting. 3,700,548, Cl. 162-17.000.

Richards, Frank A. Oil skimmer. 3,700,108, Cl. 210-242.000.

Richardson, Dora Nellie; Walpole, Arthur Leonard; and Paget, George Edward, to Imperial Chemical Industries Limited. Modification of endocrine status with hydrazine derivatives. 3,700,777, Cl. 424-323.000.

Richardson, Harold; and Newman, Bruce D., to Hovermarine (Canada) Limited. Gas-cushion vehicle. 3,700,064, Cl. 180-119.000.

Richardson, John M.: *See—*
Myer, Jon H.; O'Mera, Thomas R.; and Richardson, John M., 3,700,907.

Richeson, William E., Jr.; and Roach, Joel K., to Magnavox Company, The. Facsimile reverse signaling system. 3,700,810, Cl. 179-4.000.

Ricketts, Alan W., Jr.: *See—*
Chace, Donald E.; Melvin, James A., Jr.; Ricketts, Alan W., Jr.; Steinberger, Edward P.; and Symmes, David T., 3,701,113.

Ricoh Co., Ltd.: *See—*
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Ridgway, Michael: *See—*
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Riess, Joseph A.; and Vespie, Conrad P., to General Motors Corporation. Three-phase inverter control circuit. 3,701,001, Cl. 321-5.000.

Riley, Ray Joe, 1/4 each to Bridges, John, Gilbreath, John and Thurman, Lewis. Shelled corn-cottonseed animalfeed. 3,700,459, Cl. 99-2.00r.

Ringel, Melvin B.: *See—*
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Riordan, Pauline F.: *See—*
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Ripper, Jose Ellis: *See—*
Paoli, Thomas Lee; and Ripper, Jose Ellis, 3,701,044.

Rishton, Michael L.: *See—*
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Rissolo, Herman A., to Branson Instruments, Incorporated. Submersible ultrasonic transducer assembly. 3,700,937, Cl. 310-8.900.

Ritchie, Robert T.: *See—*
Davidge, Ronald V.; Locklar, Henry C.; Ralston, James C.; and Ritchie, Robert T., 3,700,328.

Ritsopoulos, Sotirios Constantine: *See—*
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Ritter, Josef: *See—*
Ritter, Klaus; Gott, Hans; Ritter, Josef; and Ritter, Gerhard, 3,699,756.

Ritter, Klaus; Gott, Hans; Ritter, Josef; and Ritter, Gerhard, to EVG Entwicklungs- und Verwertungsgesellschaft m.b.H. Machine for manufacturing steel structural part. 3,699,756, Cl. 219-56.000.

Ritzer, Ulrich. Device for furnishing vital and costly food with ornaments and writing. 3,699,879, Cl. 99-450.100.

RIV-SKF Officine de Villar Petosa S.p..: *See—*
Pettazzi, Paolo, 3,699,792.

Roach, Charles D., to United States of America, Army. Method for arresting propagating fractures in stressed-skin monocoque type of construction. 3,700,517, Cl. 156-94.000.

Roach, Joel K.: *See—*
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Robbisn, William Paul; and Bullock, Clifford Ralph. Closure for flexible container. 3,700,019, Cl. 150-3.000.

Roberts, Carlton E.; Rahn, Hilton N., Jr.; and Reid, Walter E., Jr., to Bethlehem Steel Corporation. Method for producing double-reduced container stock having good resistance to corrosion and product produced thereby. 3,700,504, Cl. 148-2.000.

Roberts, George C.: *See—*
Vincent, Daniel B.; Vincent, Daniel A.; and Roberts, George C., 3,700,017.

Roberts, John A.; Roberts, Peter R.; and Kelly, James E., to Brunswick Corporation. Elastic metal filament yarn. 3,699,768, Cl. 57-144.000.

Roberts, Leslie: *See—*
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Roberts, Peter R.: *See—*
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Robertson, James D., to Westinghouse Electric Corporation. Motor drive position movement profile calibration. 3,700,379, Cl. 444-1.000.

Robertson, Jeffrey C.: *See—*
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Robin, Michael; and Schulte, Sheldon R., to Ashland Oil & Refining Company. Triazine derivatives of thiobisphenols and process of preparation. 3,700,666, Cl. 260-248.0cs.

Robinson, Franklin M.; and Anderson, Paul S., to Merck & Co., Inc. 2'-Hydroxy-2,3,5-trimethyl-6,7-benzomorphan. 3,700,734, Cl. 260-293.540.

Robinson, John K.; and Voge, Hervey H., to Shell Oil Company. Dehydrogenation process over platinum on lithiated mordenite. 3,700,749, Cl. 260-683.30r.

Robinson, Thomas C.: *See—*
Kitrilakis, Sotiris; and Robinson, Thomas C., 3,699,956.

Robinson, Thomas C., to Tecna Corporation. Vas prosthesis for reversible sterilization. 3,699,957, Cl. 128-1.00r.

Robson, George E.: *See—*
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Rodbell, Donald Stanley; and Lommel, James M., to General Electric Company. Magnetic films having a predetermined coercivity. 3,700,500, Cl. 117-239.000.

Rodemann, Alfred H.: *See—*
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Rodgers, Charley R.: *See—*
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Roeller, Erhart P. Multi-indicator setup gauge. 3,699,659, Cl. 33-172.00r.

Roeschlein, Eugene R., to United States of America, Navy. Dual delayed sequence generator with read only memory control for 256 output triples for plane and spherical wave-front simulations. 3,700,780, Cl. 35-10.400.

Roever, William L.: *See—*

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Rohm & Haas Company: *See—*
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Rohm and Haas Company: *See—*
Switchenbank, Colin; and Viste, Kenneth L., 3,700,732.
Rollins, Lester G. Cutter chain support means. 3,700,285, Cl. 299-83.000.
Romick, Roscoe B.; and Strauss, John G., to U.S. Natural Resources, Inc. Apparatus for collecting and discharging lumber. 3,700,120, Cl. 214-16.00b.
Rooney, Clarence S.: *See—*
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Rose, Swlwyn H.: *See—*
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Rosen, Marvin: *See—*
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Rosiek, Frank C., to Budd Company, The. Method of locking a bolt in an assembly by external staking. 3,699,637, Cl. 29-432.100.
Ross, Brian Francis; and Spicer, Dalton Harold, to Deere & Company. Windrower drive means. 3,699,751, Cl. 56-10.300.
Ross, Donald L.: *See—*
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Siciari, Francesco; Rossi, Pietro Paolo; Calgari, Seba; and Jacuone, Roberto, 3,700,631.
Roth, Eric Michael. Fabric applying apparatus. 3,699,626, Cl. 29-200.00b.
Rouse, George V.: *See—*
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Rouse, William H., to North American Rockwell Corporation. Dampener control system for lighographic printing press. 3,700,984, Cl. 318-77.000.
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Rubberindustrie Vasto N.V.: *See—*
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Ruben, Henning M.: *See—*
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Rubin, Robert G., to Jones and Laughlin Steel Corporation. Vacuum vapor deposited zinc coatings. 3,700,485, Cl. 117-71.00m.
Ruchser, Erich: *See—*
Herion, Erich; and Ruchser, Erich, 3,699,993.
Rudel, Kurt, to Gerdts, Gustav F., KG. Check valve. 3,700,001, Cl. 137-543.210.
Rueger, Herman; and Keller, Joseph Richard, to AMP Domestic Inc. Termination method for optic means. 3,699,651, Cl. 29-630.00a.
Ruekberg, Herbert S., to Continental Can Company, Inc. End unit and liner for aerosol containers. 3,700,136, Cl. 220-63.00r.
Ruggiero, Edward M., to Displaytek Corporation. Thermal display module. 3,700,852, Cl. 219-216.000.
Rutishauser, Max: *See—*
Gasche, Urs; Lindlar, Herbert; Rutishauser, Max; and Steiner, Riedholz Kurt, 3,700,501.
Ryan Aeronautical Company: *See—*
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Ryan, Edward Clyde. Position control for parallel hydraulic systems on an agricultural implement. 3,700,041, Cl. 172-316.000.
Rychlewski, Thaddeus V.: *See—*
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Ryley, Derek Vernon; and Claydon, Gyongyver, to Marconi Company Limited, The. Misregistration correction for color television cameras. 3,700,789, Cl. 178-5.40m.
Ryley, Derek Vernon; and Claydon, Gyongyver, to Marconi Company Limited, The. Colour television cameras. 3,700,790, Cl. 178-5.40m.
Rysti, Ilkka Arimo. Dosing device for use in log handling installations. 3,700,116, Cl. 214-1.0pb.
Saab-Scania Aktiebolag: *See—*
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Sachs, Charles M.: *See—*
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Saenger, Franz; and Straub, Dieter, to Licentia Patent-Verwaltungs-G.m.b.H. Parallel binary carry look-ahead adder system. 3,700,875, Cl. 235-175.000.
Safonov, George M. Fission-electric converter. 3,700,935, Cl. 310-3.00r.
Sahlstrom AB: *See—*
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Saito, Hisatuna. Gap controlling device for a cone crusher. 3,700,175, Cl. 241-37.000.
Saito, Yuzi: *See—*
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Sakakibara, Shigeru: *See—*
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Sakamoto, Kenro; Tanaka, Motoaki; Hanzawa, Teruo; and Kasai, Keiji. Light-sensitive silver halide color photographic material containing couplers and couplers solvents. 3,700,454, Cl. 96-100.000.
Sakamoto, Kuniaki: *See—*
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Sakurai, Yasunobu, to Denki Onkyo Company, Limited. Horizontal deflection circuits for television receivers. 3,700,959, Cl. 315-29.000.
Salamony, James E.; and Starnes, William H., Jr., to Esso Research and Engineering Company. Coal liquefaction using carbon radical scavengers. 3,700,583, Cl. 208-8.000.
Salata, Eugene A., to United States of America, Navy. Sexless hose coupling. 3,700,269, Cl. 285-78.000.
Salter, George, & Co., Ltd.: *See—*
Leadbeater, Douglas Albert, 3,701,009.
Samuel, Trevor N.: *See—*
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San Emeterio, Juan J., to Raymond Lee Organization, Inc., The. Missile throwing apparatus having connectors holding targets in a given spaced relationship. 3,700,240, Cl. 273-95.00r.
Sanders Associates, Inc., mesne: *See—*
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Sanderson, Glenn A.: *See—*
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Sangamo Electric Company: *See—*
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Sankyo Company, Limited: *See—*
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Sanyo Electric Co., Ltd.: *See—*
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Sapkus, Jurgis: *See—*
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Sapkus, Jurgis, to Mattel, Inc. Doll with blunking eyelids moved by a pendulum. 3,699,707, Cl. 46-166.000.
Sapkus, Jurgis; Lewis, J. Stephen; and Sporrong, Robert N., to Mattel, Inc. Appendage animating means for figure toys. 3,699,713, Cl. 46-119.000.
Saraber, Petrus Gerardus, to Gizeh-Werk G.m.b.H. Cigarette-making appliance. 3,699,975, Cl. 131-70.000.
Sarns, Inc.: *See—*
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Sasaki, Shigeki: *See—*
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Sato, Hiroko: *See—*
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Sato, Kazuo; and Aoki, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for measuring the distance of travel and the speed of a moving object. 3,701,151, Cl. 343-9.000.
Sato, Kiichi; and Ogura, Isamu, said Ogura assor. to Oki Electric Industry Company Limited. Memory device and method of making the same. 3,699,648, Cl. 29-604.000.
Sato, Masatoshi: *See—*
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Sato, Mikio: *See—*
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Sato, Ryuichi: *See—*
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Sato, Wasuke; Hatakeyama, Shigeyuki; Koide, Masashi; Yamamoto, Sadao; and Fujisawa, Mitsumaro, to Showa Denko Kabushiki Kaisha. Method for manufacturing plastic cushioning material. 3,700,523, Cl. 156-210.000.
Sato, Yoshikatsu, to Toyo Seikan Kabushiki Kaisha. Method of sealing the seaming portions of a can. 3,700,524, Cl. 156-218.000.
Sato, Yoshio: *See—*
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Satterfield, Horner E.; Stottlemyer, Keith D.; Brown, David L.; and Roberts, Leslie, to United States of America, Army. Bonding process for polyphenylene oxidedielectric microwave circuits and bonded assembly. 3,700,547, Cl. 161-213.000.
Saucy, Gabriel; and Scott, John William, to Hoffmann-La Roche Inc. Total steroid synthesis employing substituted isoxazole derivatives. 3,700,661, Cl. 260-240.00e.
Saunders, James R.: *See—*
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Sautbine, Willis T. Self-righting marker. 3,699,913, Cl. 116-63.00p.
Savage, Bruce Russell, to Bell Telephone Laboratories, Incorporated. Digital constant-percent-break pulse correcting signal timer. 3,700,821, Cl. 179-16.00e.
Saxena, Arjun Nath, to RCA Corporation. Schottky barrier diode and method of making the same. 3,700,979, Cl. 317-235.00r.
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Scales, Ralph E.; and Whitley, James O., Jr., to Bethlehem Steel Corporation. Apparatus for transferring fluid from an underwater storage unit to a floating vessel. 3,700,014, Cl. 141-388.000.
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Scarnato, Thomas J.; Peacock, Peter J.; and Kowalik, John J., to International Harvester Company. Pre-stressed tie guard with section retainer. 3,699,758, Cl. 56-307.000.
Schad, Charles A., to Kalium Chemicals Limited. Magnetometer consisting of two sensors with means for unbalancing each sensor at null condition. 3,701,007, Cl. 324-43.00r.
Schader, Arne: *See*—
Schullstrom, Sten Gunde; Freijd, Ingvar; Schader, Arne; and Olofsson, Nils Gunnar, 3,701,075.
Schaefer, George E.: *See*—
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Schaffer, Detlef: *See*—
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Schaller, Norman C.: *See*—
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Scheibe, Harold R.; and Blankenship, John E., to United States of America, Navy. Helicopter cyclic and collective pitch mechanism. 3,700,350, Cl. 416-114.000.
Scheibel, Axel: *See*—
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Scheid, William J., to Raytheon Company. Odor control appliance. 3,700,378, Cl. 431-253.000.
Scheinkoenig, Robert J.; and Haupt, Robert C., to Allis-Chalmers Corporation. Fender louver. 3,700,259, Cl. 280-152.00r.
Schenkerberg, William F., to Dart Industries, Inc. High impact polypropylene blends. 3,700,614, Cl. 260-23.00h.
Scher, Herbert I. High pressure laminates with deeply embossed surface. 3,700,537, Cl. 161-89.000.
Schering A.G.: *See*—
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Schering Aktiengesellschaft: *See*—
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Scheu, Rudol. Teeth regulating device having a U-shape rigid bracket anchored in the posterion portions of a plate. 3,699,656, Cl. 32-14.00e.
Schiffmann, Robert F.; Stein, Ernest W.; and Kaufman, Harold B., Jr., to DCA Food Industries, Inc. Dough proofing apparatus. 3,699,899, Cl. 107-57.00c.
Schilling, Winston H.: *See*—
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Schluter, Franz, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Container for loose material. 3,700,145, Cl. 222-202.000.
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Schubert, Paul, to Cross Europa-Werk GmbH. Eccentric boring spindle. 3,700,345, Cl. 408-150.000.
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Schulman, Bernard L., to Esso Research and Engineering Company. Production of high octane gasoline from coal liquids. 3,700,586, Cl. 208-89.000.
Schulte, Sheldon R.: *See*—
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Schultes, Hermann, to Olin Corporation. Metal edge members for skis having varied lengthwise stress-strain ratio and skis including such members. 3,700,252, Cl. 280-11.13n.
Schulze-Berge, Karl J., to AMF Incorporated. Adjustable timer cam assembly spring biased by contacts for normal engagement with synchronous motor driven gear. 3,700,837, Cl. 200-38.00r.
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Schwab, Delmar G., to Hy-Torq Corporation. Differential drive mechanism. 3,700,082, Cl. 192-50.000.
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Seelbinder, David C., to Eastman Kodak Company. Process and apparatus for sensitometrically testing a liquid photosensitive emulsion. 3,700,335, Cl. 356-201.000.
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Seidenberg, Benjamin; and Hobbs, Alfred J., to United States of America, National Aeronautics and Space Administration. Method and apparatus for determining the contents of contained gas samples. 3,700,893, Cl. 250-41.950.
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Taylor, Robert W.; and Sellers, Jerry W., 3,699,655.

Seltzer, Daniel Arron: *See—*
Evans, Ross Hugh; Seltzer, Daniel Arron; and Young, Robert Leonard, 3,700,816.
Seltzer, Raymond; and Gordon, David A. Diamino-s-triazines. 3,700,665, Cl. 260-248.0cs.
Sepulveda, William, Jr.: *See—*
Aasen, Torulf F.; Mogil, Bernard; and Sepulveda, William, Jr., 3,700,231.
Servadio, Robert. Automatic safety seat clamp. 3,700,281, Cl. 297-390.000.
Servo Corporation of America, mesne: *See—*
Reynolds, Christopher C., 3,700,860.
Seasody, Donald W., to Applied Power Industries, Inc. Traversing workholding clamp. 3,700,227, Cl. 269-24.000.
Seto, Tetsuki: *See—*
Hamada, Takaki; Nakashio, Seizo; Maruta, Isao; Hayatsu, Kazuo; Seto, Tetsuki; and Kono, Yoichi, 3,700,630.
Settipani, Antoine: *See—*
Gaggero, Giancarlo; Mongini-Tamagnini, Carla; and Settipani, Antoine, 3,700,162.
Sevenich, Theodor Josef; Fabian, Wolfgang; and Kuhn, Klaus, to Maschinen- und Werkzeugbau GmbH. Pusher-type furnace. 3,700,122, Cl. 214-24.000.
Seymour Foods, Inc.: *See—*
Willsey, Charles H., 3,699,744.
Shackelford, John R.: *See—*
Criss, William H.; and Shackelford, John R., 3,699,877.
Shaddock, Roland E., to Myers-Sherman Company. Double-acting tandem Piston pump. 3,700,360, Cl. 417-404.000.
Sharkey, Hubert Joseph; and Sturwold, Robert J., to Emery Industries, Inc. Polyamides exhibiting improved freeze-thaw characteristics in printing ink compositions. 3,700,618, Cl. 260-33.40r.
Sharov, Nikolai Grigorievich: *See—*
Vagin, Alexei Alexeevich; Yablonsky, Stanislav Valerievich; Voloshin, Petr Stepanovich; Sharov, Nikolai Grigorievich; Shiborin, Viktor Ivanovich; Novakovsky, Vladimir Efimovich; Kolpakov, Grigory Vasilievich; Ivanov, Mark Efremovich; Lindin, Viktor Mikhailvich; and Lipsky, Daniil Yakovlevich, 3,700,364.
Shaver, William R.; and Schuller, James J., to Pullman Incorporated. Pneumatic discharge arrangement for railway car hoppers. 3,700,143, Cl. 222-148.000.
Sheahan, Desmond F.; and Callander, George C., to GTE Automatic Electric Laboratories Incorporate. Apparatus for monitoring of the deposition of metallic films. 3,699,916, Cl. 118-9.000.
Shears, Stuart T., to TRW Inc., mesne. Unitary sheet metal key loop retainer. 3,700,392, Cl. 70-45.0cb.
Sheena, David: *See—*
Chabot, Ronald W.; Leonard, George S.; and Sheena, David, 3,699,856.
Shell Oil Company: *See—*
Bezemer, Cornelis; Tadema, Harco J.; and Houbolt, Jacob J.H.C., 3,700,593.
Campen, Jan P.; and Kok, Riekert, 3,700,767.
Finch, Albert M. T., Jr., 3,700,637.
Haase, Richard J.; and Roever, William L., 3,701,088.
La Heij, Gerardus E.; and Van Amerongen, Gerrit J., 3,700,757.
Langner, Carl G.; and Visser, Robert C., 3,699,691.
Montgomery, William C., Jr.; and Vogel, Charles B., 3,700,871.
Papadopouos, Michael N.; and Ueber, Russell C., 3,700,280.
Robinson, John K.; and Voge, Hervey H., 3,700,749.
Van Kralingen, Peter H., 3,700,763.
Wald, Milton M.; and Gaum Myron G. (said Wald assor. to), 3,700,633.
Winkler, De Loss E., 3,700,748.
Shellhause, Ronald L. Hydraulic power brake booster and open center control valve therefor. 3,699,680, Cl. 60-54.60f.
Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L., to Merck and Co., Inc. Substituted phenylsulfamyl salicyclic acids and derivatives thereof in the treatment of inflammation. 3,700,773, Cl. 424-230.000.
Shen, Tsung-Ying, to Merck & Co., Inc. Use of p, p'-bis-ureidodiphenyl sulfone in treating Marek's disease. 3,700,776, Cl. 424-322.000.
Sheppard, William Arthur: *See—*
Cairncross, Allan; and Sheppard, William Arthur, 3,700,693.
Sher Walls Inc.: *See—*
Sherwood, John C., 3,700,385.
Sherrick, James W., to Lord Corporation. Resilient bearing adapter for railway trucks. 3,699,897, Cl. 105-218.00r.
Sherry, Jeffrey Rufus: *See—*
Schmitt, Joseph Michael; Sherry, Jeffrey Rufus; and Robustelli, Albert George, 3,700,754.
Sherwood, John C., to Sher Walls Inc. Panel and stile construction. 3,700,385, Cl. 52-36.000.
Shiborin, Viktor Ivanovich: *See—*
Vagin, Alexei Alexeevich; Yablonsky, Stanislav Valerievich; Voloshin, Petr Stepanovich; Sharov, Nikolai Grigorievich; Shiborin, Viktor Ivanovich; Novakovsky, Vladimir Efimovich; Kolpakov, Grigory Vasilievich; Ivanov, Mark Efremovich; Lindin, Viktor Mikhailvich; and Lipsky, Daniil Yakovlevich, 3,700,364.
Shiells, Daniel A. Process for purifying water utilized in a boiling water reactor. 3,700,550, Cl. 176-37.000.
Shigezane, Keisuke: *See—*
Yamamura, Yuichi; Kokubu, Tatsuo; Shigezane, Keisuke; and Mizoguchi, Tomishige, 3,700,651.
Shiio, Isamu; and Sato, Hiroko, to Ajinomoto Co., Inc. Method of producing tryptophan by fermentation. 3,700,559, Cl. 195-29.000.
Shimada, Mitsuhiro: *See—*
Suzuki, Yoshiji; Hayashi, Ikuo; Karasawa, Kazuo; and Shimada, Mitsuhiro, 3,700,953.
Shimada, Takashi, to Tokyo Shibaura Electric, Ltd. Microwave tube assembly. 3,700,963, Cl. 315-5.380.
Shimago, Kozo: *See—*
Yamamoto, Michihiro; and Shimago, Kozo, 3,700,736.
Shimauchi, Shiro; Kitamura, Yuko; Iwabuchi, Osamu; and Matsui, Takeshi, to Teijin Limited. Method of dyeing textile fibers with an anionic dyestuff in the presence of quaternary ammonium salt. 3,700,399, Cl. 8-30.000.
Shimizu, Katsumi: *See—*
Egawa, Susumu; Ashizaki, Shigeya; Shimizu, Katsumi; and Miyati, Toshiko, 3,700,954.
Shimizu, Massao, to Denki Onkyo Company, Limited. High voltage generating apparatus. 3,700,936, Cl. 310-8.100.
Shimomura, Jun, to Nippon Kogaku K.K. Device for driving reflecting mirror of single-lens reflex camera. 3,699,864, Cl. 95-42.000.
Shimomura, Jun, to Nippon Kogaku K.K. Coupling device for exposure meter to aperture of interchangeable lens in single-lens reflex camera. 3,699,868, Cl. 95-64.00r.
Shiney Co.: *See—*
Sumi, Kiyoshi; and Sunano, Naomasa, 3,699,803.
Shinomiya, Masayasu: *See—*
Wakamatsu, Shigeru; Kondo, Ryozo; and Shinomiya, Masayasu, 3,700,669.
Shinskey, Francis G., to Foxboro Company, The. Batch dryer control apparatus. 3,699,665, Cl. 34-48.000.
Shipowners Refrigerated Cargo Research Association: *See—*
Hale, Kenneth Calvert; and Scrine, Gerald Robin, 3,699,694.
Shirai, Takeaki; Sakakibara, Shigeru; Noguchi, Masaaki; and Sumiyoshi, Masharu, to Nippon Denso Kabushiki Kaisha, and and Toyota Jidosha Kogyo Kabushiki Kaisha. Automatic transmission effective for changing speed by brake pressure. 3,700,079, Cl. 192-4.00a
Shirayama, Kenzo: *See—*
Tersada, Hiroshi; and Shirayama, Kenzo, 3,700,753.
Shiroishi, Akihiro: *See—*
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Shirzad, Paul P.: *See—*
Gacs, Peter T.; and Shirzad, Paul P., 3,699,600.
Shiu, Peter D. Animated display device and method. 3,699,698, Cl. 40-106.350.
Shoemaker, Arthur H., to American Optical Corporation. Eight component 100X microscope objective. 3,700,311, Cl. 350-214.000.
Shoffner, Willie M. Check out system. 3,700,074, Cl. 186-1.0ac.
Shonka, Francis R.: *See—*
Baisz, George J.; and Shonka, Francis R., 3,701,080.
Shonka, Louis M.: *See—*
Baisz, George J.; and Shonka, Francis R., 3,701,080.
Shore, David Teignmouth; and Starkie, Granville Lewis, to A.P.V. Company, Limited, The. Sterilizing separate compartments of particulate material. 3,700,468, Cl. 99-216.000.
Short, James E., Jr., to United States of America, Navy. Fire resistnat photoflash cartridge. 3,699,890, Cl. 102-37.800.
Showa Denko Kabushiki Kaisha: *See—*
Sato, Wasuke; Hatakeyama, Shigeyuki; Koide, Masashi; Yamamoto, Sadao; and Fujisawa, Mitsumaro, 3,700,523.
Shrimpton, Ronald Horace; and Dunkley, Keith William. Printers blankets. 3,700,541, Cl. 161-160.000.
Shriver, Joe E.: *See—*
Koch, Earl E.; and Shriver, Joe E., 3,699,754.
Shuey, David R.; and Norian, Roger F., to Xerox Coroporation. Braking methods and apparatus. 3,700,990, Cl. 318-375.000.
Shughart, Mervin Leonard, to AMP Incorporated. Apparatus for assembling articles in strip form to workpieces. 3,699,631, Cl. 29-203.00b.
Shumaker, Charles Storer, to United Engineering and Foundry Company. Apparatus for feeding strip-like material to a processing apparatus. 3,700,157, Cl. 228-3.000.
Sibbert, Donald, J.: *See—*
Anderson, Howard H.; Moyer, Rudolph H.; Sibbert, Donald, J.; and Sutherland, David C., 3,700,896.
Siclari, Francesco; Rossi, Pietro Paolo; Calgari, Seba; and Jacuone, Roberto, to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Method for the production of acrylonitrile polymers and copolymers. 3,700,631, Cl. 260-85.500.
Siddall, John B., to Zoecon Corporation. Insect control. 3,700,694, Cl. 260-343.600.
Siddall, John B., to Zoecon Corporation. Boll weevil sex attractant. 3,700,696, Cl. 260-343.500.
Siefen, Jakob: *See—*
Schruff, Horst; Lehmann, Helmut; Siefen, Jakob; Mathner, Hermann; Adams, Willi; and Weiss, Gunter, 3,700,531.
Siegel, Herman M., to Lowe, E. S., Company, Inc. Drawing device. 3,699,660, Cl. 33-174.00b.
Siemens Aktiengesellschaft: *See—*
Boech, Werner; and Kobler, Ulrich, 3,701,066.
Siemssen, Ernst A.: *See—*

Turner, Charles A.; and Siemssen, Ernst A., 3,699,726.
Siergiej, John M.: *See—*
Abkowitz, Stanley; Siergiej, John M.; and Regan, Ronald D., 3,700,434.
Sievers, Robert E. Rare earth complexes as nuclear magnetic resonance shift reagents. 3,700,410, Cl. 23-230.00r.
Sigagoose, Glen. Model airplane and method of assembling same. 3,699,706, Cl. 46-78.000.
Sigl, Jon D. Portable arrow checking device. 3,700,940, Cl. 310-66.000.
Signatron, Inc.: *See—*
Jackson, Charles L., 3,701,019.
Signetics Corporation: *See—*
Isaac, George L.; Kingsbury, Richard F.; and Surak, John G., 3,701,021.
Simmonds Precision Products, Inc.: *See—*
Knight, John H., 3,700,864.
Simmons, Clyde A.: *See—*
Lunsford, Leslie E.; Simmons, Clyde A.; and Evans, William L., 3,699,664.
Simms, Dudley V. Stable oscillator. 3,701,051, Cl. 331-107.00t.
Simonds, Peter, to Canada, Her Majesty the Queen in the right of, as represented by the Minister of National Defence. Discone antenna. 3,701,159, Cl. 343-745.000.
Sims, Clarence R. Floor cleaning device adapted for securement to a shoe. 3,699,672, Cl. 36-7.700.
Simshauser, Anthony J.: *See—*
Meraz, Daniel, Jr.; and Simshauser, Anthony J., 3,699,893.
Sinclair, Albert R.: *See—*
Terry, William M.; Graham, John W.; Sinclair, Albert R.; and Kiel, Othar M., 3,700,032.
Sinclair-Koppers Company: *See—*
Hulse, George E.; and Harris, James J., 3,700,639.
Singer Company, The: *See—*
Ahrns, Wilbur C.; Sweeney, David F.; and Dannatt, Hugh St., 3,700,087.
Ketterer, Stanley J., 3,699,911.
Urciola, John A.; and Marsh, Walter H. W., 3,699,910.
Waibel, Helmut K., 3,700,142.
Wiseman, Neil L., 3,701,104.
Singer Company, The, mesne: *See—*
Bilinski, Donald J.; and Weisbord, Leon, 3,700,289.
Ensinger, Willis B., 3,700,290.
Singer, Malcolm S., to Chevron Research Company. N-(1-azido-2, 2,2-trihaloethyl) sulfonamides. 3,700,699, Cl. 260-349.000.
Sitz, Tilbert C., to Collins Radio Company. Cable winding apparatus. 3,700,180, Cl. 242-54.00a.
Sivertson, Wilford E., Jr., to United States of America, National Aeronautics and Space Administration. Logical function generator. 3,700,868, Cl. 235-152.000.
Sixt, Marty E., to Advanced Drainage Systems, Inc. Corrugated drainage tubes and fittings. 3,699,684, Cl. 61-11.000.
Skatrud, Ralph O.: *See—*
Laurer, George J.; and Skatrud, Ralph O., 3,700,859.
SKF Industrial Trading and Development Company N.V.: *See—*
Nilsson, Sven Walter, 3,699,823.
Skinner, Harvey G., to Vulcan, Inc. Hollow knob constructions. 3,699,613, Cl. 16-121.000.
Skolnick, Michael L.; and Buczek, Carl J., to United Aircraft Corporation. Nonresonant interferometric optical isolator. 3,700,309, Cl. 350-163.000.
Slagle, Rufus L. Odometer. 3,700,164, Cl. 235-95.00r.
Slomski, Stanley L., to General Electric Company. Lamp and reflector assembly. 3,700,881, Cl. 240-41.35r.
Slope Incorporated: *See—*
Drapeau, Raoul E., 3,700,807.
Slutman, Allen C.: *See—*
Finnegan, Edward D.; Harper, Leonard Roy; Mitrofanoff, Nicholas S.; and Slutman, Allen C., 3,701,105.
Sluys, Robert Nestor Joseph; Wessels, Johannes Hendrik; and Van Den Bussche, Willem, to U.S. Philips Corporation. Method of recording and/or reproducing video signals. 3,700,798, Cl. 178-6.6af.
Smaller, Philip; and Treves, David, to Ampex Corporation. Modulated magnetooptic readout system. 3,701,133, Cl. 340-174.10m.
Smith, Alfred H.: *See—*
Razzano, John S.; and Smith, Alfred H., 3,700,473.
Smith, Bob L. Fluidic phase shifter. 3,701,058, Cl. 333-31.00a.
Smith, Donald A., to Eastman Kodak Company. Synthetic polymeric photographic emulsion vehicles. 3,700,456, Cl. 96-114.000.
Smith, Gerald C.; and Williams, Raymond J., to Eastman Kodak Company. Control circuit for automating the operation of a film cutter or like apparatus. 3,699,832, Cl. 83-210.000.
Smith Industries Limited: *See—*
Smith, Terry Reginald, 3,699,914.
Smith, Leif H., to Brown & Root, Inc. Method and apparatus for laying pipelines grouped in a bundle. 3,699,692, Cl. 61-72.300.
Smith, Luther W.; and Snitzer, Elias, to American Optical Corporation. Efficient illumination of the cores only of a fiber optic bundle using holography. 3,700,303, Cl. 340-3.500.
Smith, Marvin Glenn, to Helmerich & Payne, Inc. Sealing gasket. 3,699,735, Cl. 52-400.000.
Smith, Oliver Wendell; Weigel, James Edward; and Trecker, David John, to Union Carbide Corporation. Radiation-curable acrylate-capped polycaprolactone compositions. 3,700,643, Cl. 260-77.5an.
Smith, Richard M., to United States of America, Navy. Bragg angle optical matched filter system with coded glass transmission plate. 3,700,910, Cl. 250-225.000.
Smith, Russell G. Valve with flow regulating means. 3,700,003, Cl. 137-614.170.
Smith, Stephen Hagar, to McCulloch Corporation. Rapid charging of batteries. 3,700,997, Cl. 320-20.000.
Smith, Terry Reginald, to Smith Industries Limited. Liquid level indicators. 3,699,914, Cl. 116-118.000.
Smith, Victor S. Display system. 3,700,880, Cl. 240-10.00r.
Smith, William C. End shift indicator for platform scales. 3,700,052, Cl. 177-134.000.
Smith, William Mayo, Jr.: *See—*
Beale, John H.; and Smith, William Mayo, Jr., 3,700,632.
Smrt, Thomas J. Spraying apparatus. 3,700,144, Cl. 222-176.000.
Snethen, Thomas H., to United Business Equipment Corporation. Check separator system. 3,700,118, Cl. 214-1.00r.
Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Siclari, Francesco; Rossi, Pietro Paolo; Calgari, Sebs; and Jacuone, Roberto, 3,700,631.
Snitzer, Elias: *See—*
Smith, Luther W.; and Snitzer, Elias, 3,700,303.
Snook, Richard K.; and Stout, Rodney W., to Diginetics Incorporated. Indicia system for credit cards and the like. 3,700,862, Cl. 235-61.12m.
Sobel, Alan: *See—*
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Societe a Responsabilite Limitee: Forges & Trefileries de Conflandey: *See—*
Jouin, Alfred, 3,699,627.
Societe Anonyme d'Explosifs Industriels-Celtite: *See—*
Bourland, Andre, 3,699,687.
Societe Belge pour l'Industrie Nucleaire S.A.: *See—*
Van Dievoet, Jean-Paul Laurent, 3,699,638.
Societe Chimique des Charbonnages tour Aurore: *See—*
Aubry, Jean, 3,700,741.
Societe des Aciers Fins de l'Est: *See—*
Pomey, Jacques, 3,700,779.
Societe Financiere Franciase de Licences et Breveta: *See—*
Jakob, Horst, 3,699,618.
Soden, George B. Star wheel operating mechanism. 3,700,163, Cl. 235-91.00m.
Sohne and Ernest Beckert Nadelfabrik Commandit-Gesellschaft: *See—*
Berentzen, Hardo, 3,699,784.
Solartron Electronic Group: *See—*
Ley, Anthony John, 3,700,865.
Soma, Nobuo; Watatani, Mitsuo; Nakazawa, Junichi; Sato, Yoshio; Kuwabara, Yoshimi; and Ishikawa, Hidehiko. Certain pyridinium derivatives of cycloheptyl-imidazoles. 3,700,682, Cl. 260-295.5.
Somerset, Sherman J., to International Telephone and Telegraph Corporation. Coaxial connector. 3,701,086, Cl. 339-177.00r.
Sonnabend, Lawrence F., to Dow Chemical Company, The. Cellulosic products treated with improved quaternary ammonium electroconductive additives from vinylaromatic polymers. 3,700,493, Cl. 117-201.000.
Sooner Door Hardware Manufacturing Company: *See—*
Schwarz, Charles A., 3,699,608.
Sorensen, Clarence A.; and Deremo, Edwin J., to Gardner-Denver Company. Low inertia motor for fluid operated tool. 3,700,363, Cl. 418-270.000.
Sorgenfrei, Frederick J., to Minnesota Mining and Manufacturing Co. Smooth high tolerance porous tube and process for making. 3,700,419, Cl. 29-182.200.
Sosalla, Harry; Meusburger, Lyle M.; and Jarnagin, Max L., to Noble Manufacturing Company. Foldable implement cart with forwardly tacking means for the cable arm retaining means. 3,700,040, Cl. 172-311.000.
Sosin, Boleslaw Marian, to Marconi Company, Limited, The. Parallel amplifiers with input and output sequences of hybrids. 3,701,038, Cl. 330-124.00r.
Southam, Donald L.; and Kacmarcik, Thomas J., to Harris-Intertype Corporation. Disconnect arrangement for multi-unit printing press. 3,699,887, Cl. 101-183.000.
Souza, Augustine A., to Polygon Concepts. Produce shipping container. 3,700,137, Cl. 220-97.00e.
Space Administration: *See—*
Bradley, Raymond H., 3,700,193.
Pleasants, James E.; and Dereng, Viggo G., 3,700,192.
Spacetac Incorporated: *See—*
Cocca, Theodore F., 3,699,650.
Spalding, Georg: *See—*
Beck, Otto; and Spalding, Georg, 3,700,854.
Spangler, William Gilbert; and Cross, Henry Daniel III. Detergent compositions. 3,700,401, Cl. 8-108.000.
Sparling, Raymond T.; and Dietz, William A., to Hersey-Sparling Meter Company. Cycling valve and valving assembly for water softeners. 3,700,007, Cl. 137-625.290.
Spatz, William L. Spring loaded caster for shop stools bar stools and the like. 3,699,609, Cl. 16-44.000.
Spectral Data Corporation: *See—*
Yost, Edward F., Jr., 3,700,438.

Spencer, Blaine G.; and Clinebell, Lyle R., to Caterpillar Tractor Company. Method of making mechanical joined hose coupling of extruded components. 3,699,625, Cl. 29-157.000.

Sperry Rand Corporation: *See—*
Grey, Donald M.; and Welker, Jerry W., 3,700,119.
Hurlburt, Joseph C., 3,699,757.
Hurlburt, Joseph C., 3,700,257.
Koch, Earl E.; and Shriver, Joe E., 3,699,754.

Sperry Rand Corporation, mesne: *See—*
Helms, Clifford J.; McMillan, Norman; and Papadopoulos, Stelios B., 3,700,855.

Spicer, Alvin W.; and Talalay, Anselm, to Goodrich, B. F., Company, The. Apparatus for continuously vulcanizing endless belts. 3,700,365, Cl. 425-28.000.

Spicer, Dalton Harold: *See—*
Ross, Brian Francis; and Spicer, Dalton Harold 1, 3,699,751.

Spies, Hohann, to Messerschmilt-Bolkow-Blohm Gesellschaft mit. Electric fuse circuit. 3,700,968, Cl. 317-31.000.

Spiess, C. F., & Sohn: *See—*
Haberhauer, Karl; Jutzi, Manfred; and Kiess, Reinhold, 3,700,513.

Spohr, Albert S.: *See—*
Waters, Robert S.; and Spohr, Albert S., 3,699,952.

Sporrong, Robert N.: *See—*
Sapkus, Jurgis; Lewis, J. Stephen; and Sporrong, Robert N., 3,699,713.

Spraker, Earl D., to Electronic Data Systems Corporation. Portable input-output terminal. 3,700,814, Cl. 179-2.

Sprecher & Schuh A.G.: *See—*
Heiz, Max; and Kalocay, Rudolf, 3,701,101.

Springett, James C., to United States of America, National Aeronautics and Space Administration. Audio system with means for reducing noise effects. 3,700,812, Cl. 179-1.00p.

Sprinzak, Yair, to Yeda Research and Development Co., Ltd. Process for the production of halogenated benzilic acid alkyl esters. 3,700,720, Cl. 260-473.00a.

Spurck, Richard F., to Coars Porcelain Company. Electrical component package. 3,700,788, Cl. 174-525.000.

Stachewski, Harry: *See—*
Friedrich Schatz; Stachewski, Harry; and Lehnert, Gunther, 3,700,158.

Stafsudd, Oscar M.; and Haak, Frederik A., to Hughes Aircraft Company. Gas laser materials and system therefor. 3,701,046, Cl. 331-94.500.

Stairs, Henry Marshall, to American Standard Inc. Toilet seat cover mounting. 3,699,614, Cl. 16-128.000.

Standard International Corporation: *See—*
Rauskolb, Fred W., 3,700,217.

Stange Co.: *See—*
Criss, William H.; and Shackelford, John R., 3,699,877.

Stapleton, Fred E.: *See—*
Knight, Paul A.; Saunders, James R.; and Stapleton, Fred E., 3,700,066.

Stark, Amos J.; and McGinnis, Herbert E., to Goodrich, B. F. Company, The. Catenary roll support for a conveyor belt. 3,700,092, Cl. 198-192.00r.

Starkie, Granville Lewis: *See—*
Shore, David Teignmouth; and Starkie, Granville Lewis, 3,700,468.

Starnes, William H., Jr.: *See—*
Salamony, James E.; and Starnes, William H., Jr., 3,700,583.

Staudenmayer, Karl, to Ford Motor Company. Energy absorbing steering column for a motor vehicle. 3,699,824, Cl. 74-492.000.

Stauffer Chemical Company: *See—*
Brokke, Mervin E.; and Williamson, Thomas B., 3,700,668.
Fancher, Llewellyn W., 3,700,771.
Mihailovski, Alexander, 3,700,678.

Steck, William F., III, to Weaver, W. R., Company. Gun sight. 3,700,339, Cl. 356-247.000.

Steckler, Steven Alan, to RCA Corporation. Electronic signal amplifier. 3,701,032, Cl. 330-18.000.

Stedman, Robert J., to United States of America, Navy. Video gate. 3,700,799, Cl. 178-6.000.

Steelastic Company, The: *See—*
Alderfer, Sterling W., 3,700,012.

Steele, James W.: *See—*
McCoy, J. C.; and Steele, James W., 3,700,535.

Stefanucci, Arthur; and Yadlowsky, Slawko. Balanced coffee flavors. 3,700,462, Cl. 99-68.000.

Stefenel, Rudy S., to Wiltron Company. Variable gain amplifier system. 3,701,036, Cl. 330-85.000.

Stein, Ernest W.: *See—*
Schiffmann, Robert F.; Stein, Ernest W.; and Kaufman, Harold B., Jr., 3,699,899.

Steinberger, Edward P.: *See—*
Chace, Donald E.; Melvin, James A., Jr.; Ricketts, Alan W., Jr.; Steinberger, Edward P.; and Symmes, David T., 3,701,113.

Steiner, Riedholz Kurt: *See—*
Gasche, Urs; Lindlar, Herbert; Rutishauser, Max; and Steiner, Riedholz Kurt, 3,700,501.

Steinhofer, Adolf; Doerfel, Helmut; Falkenstein, Georg; and Jeserich, Wolfgang-Dieter. N-Alkyl-N-arylcarbamoyl lactams. 3,700,658, Cl. 260-239.30r.

Stephanoff, Nicholas N., to Fluid Energy Processing & Equipment Company. Drying process for pulverulent material. 3,699,662, Cl. 34-10.000.

Stephens, Nancy H.: *See—*
Acree, Elick H.; Case, Forrest Neil; and Stephens, Nancy H., 3,700,602.

Sterler, Bernard. Chess game apparatus. 3,700,242, Cl. 273-131.0kp.

Sterling Drug Inc.: *See—*
Bailey, Denis M., 3,700,697.

Stevens, Curtis E.; and Phillips, Chandler A., to Bertea Corporation. System for detecting the position of a movable element. 3,701,136, Cl. 340-199.000.

Stevens, J. P., & Co.: *See—*
Pike, Herbert J., 3,700,391.

Stevens, J. P., & Co., Inc.: *See—*
Carman, Alexander J., 3,699,783.

Stewart, Mary J.: *See—*
Price, John A.; and Stewart, Mary J., 3,700,644.
Rice, John A.; and Stewart, Mary J., 3,700,721.

Stewart, Ray T.: *See—*
Ference, Richard N.; Grega, Albert; Miller, James A.; Stewart, Ray T.; and Stricker, David M., 3,700,101.

Stewart, Russell L.: *See—*
Pawloski, Chester E.; and Stewart, Russell L., 3,700,735.

Stewart-Warner Corporation: *See—*
Stomper, Joseph M., 3,699,846.

Stich, Frederick A., to Allis-Chalmers Manufacturing Company. Phase shift detector. 3,700,919, Cl. 307-232.000.

Stiles, Charles W., to Motorola, Inc. Ka-band solid-state switching circuit. 3,701,055, Cl. 333-7.000.

Stirling, John Andrew: *See—*
Inman, Eric Richard; Macpherson, Ian Alexander; and Stirling, John Andrew, 3,700,709.

Stobbe, Richard P.; and Knapp, Richard V., to Nilsen Mfg. Co. Liquid flow control arrangement. 3,700,904, Cl. 250-218.000.

Stockl, Vilem, to Rubberindustrie Vasto N.V. Floor mat for animals. 3,699,926, Cl. 119-28.000.

Stoll, H., and Company: *See—*
Hadam, Wilhelm, 3,699,782.

Stomper, Joseph M., to Stewart-Warner Corporation. Air motor. 3,699,846, Cl. 91-346.000.

Stone, William S.: *See—*
Ditto, Edwin D.; and Stone, William S., 3,699,639.

Stookey, George K.: *See—*
Muhler, Joseph C.; and Stookey, George K., 3,699,979.

Stoppard, William E., to Leesona Corporation. Bobbin handling apparatus. 3,699,833, Cl. 83-410.000.

Storck, Robert C.: *See—*
Porter, Robert B.; Ardelt, Clarence A.; and Storck, Robert C., 3,700,081.

Stottlemyer, Keith D.: *See—*
Satterfield, Homer E.; Stottlemyer, Keith D.; Brown, David L.; and Roberts, Leslie, 3,700,547.

Stout, Rodney W.: *See—*
Snook, Richard K.; and Stout, Rodney W., 3,700,862.

Straub, Dieter: *See—*
Saenger, Franz; and Straub, Dieter, 3,700,875.

Strauss, John G.: *See—*
Romick, Roscoe B.; and Strauss, John G., 3,700,120.

Street, George Bryan: *See—*
Kanazawa, Kay Keiji; Seiki, Hajime; and Street, George Bryan, 3,700,498.

Stricker, David M.: *See—*
Ference, Richard N.; Grega, Albert; Miller, James A.; Stewart, Ray T.; and Stricker, David M., 3,700,101.

Stringer, Carl W.: *See—*
Germer, Walter F., Jr.; Stringer, Carl W.; and Harrison, William H., 3,700,031.

Strobel, Keene S., to Weyerhaeuser Company. Double slotted saw. 3,700,016, Cl. 143-140.00r.

Strobel, Rudolf G. K.: *See—*
Bolt, Gregory L.; and Strobel, Rudolf G. K., 3,700,463.

Strom, Sven O. E., to Alfa-Laval AB. Milking system. 3,699,923, Cl. 119-14.040.

Stromberg Datagraphix, Inc.: *See—*
Cunningham, Omar Leo, Jr., 3,700,318.

Struble, Glenn E., to Diamond International Corporation. Boot support and separator. 3,699,598, Cl. 12-114.600.

Struck, Charles R.: *See—*
Deverman, Kenneth D.; and Struck, Charles R., 3,699,652.

Stuart, Gerald L.: *See—*
Paschal, Forrest A.; Stuart, Gerald L.; and Pascal, Forrest A., II., 3,700,274.

Sturwold, Robert J.: *See—*
Sharkey, Hubert Joseph; and Sturwold, Robert J., 3,700,618.

Sub-Marine Systems Incorporated: *See—*
Cowans, Kenneth W., 3,699,775.

Suckow, Theodore K. Spring bar assembly for trailer hitches. 3,700,261, Cl. 280-406.00a.

Suckow, Theodore K. Spring bar trailer hitch assembly. 3,700,262, Cl. 280-406.00a.

Suh, John T.; and Bare, Thomas M., to Colgate-Palmolive Company. 1-(4-Hydroxy-3-(hydroxymethyl)-phenyl) -1-hydroxy-2-aralkylaminoethanes. 3,700,692, Cl. 260-340.500.

Sullivan, James Franklin, to Deere & Company. Depth control means for a moldboard plow. 3,700,043, Cl. 172-400.000.

Sullivan, John P., Jr., to Itek Corporation. Gelable and gelled compositions. 3,700,451, Cl. 96-66.000.

Sullivan, Robert H., to Du Pont de Nemours, E. I., and Company. Process for oxidizing xylenes to phthalic acids. 3,700,731, Cl. 260-524.00r.

Sullivan, Ronald D.: *See*—
Baldwin, Kenneth B.; and Sullivan, Ronald D., 3,701,070.

Sullivan, Wayne S., to Camelot Stone, Inc. Method of making cellular plastic building panel. 3,700,516, Cl. 156-79.000.

Sumi, Kiyoshi; and Sunano, Naomasa, to Shiney Co. Semiconductor element for detecting gases and meter for measuring component concentration of a gas mixture. 3,699,803, Cl. 73-27.00r.

Sumitomo Chemical Co., Ltd.: *See*—
Ueno, Katsuji; and Oshima, Takao, 3,700,608.

Sumitomo Chemical Company: *See*—
Yamamoto, Michihiro; and Shimago, Kozo, 3,700,736.

Sumitomo Chemical Company, Limited: *See*—
Hamada, Takaki; Nakashio, Seizo; Maruta, Isao; Hayatsu, Kazuo; Seto, Tetsuki; and Kono, Yoichi, 3,700,630.
Yamanouchi, Saburo; Yasuno, Kiyoshi; Yamatokohriyama, Kou Sota; and Okumura, Takuzo, 3,700,750.

Sumitomo Chemical Company, Ltd.: *See*—
Hirooka, Masaaki; Yasui, Seimei; Mashita, Kentaro; and Kimura, Fumiyuki, 3,700,648.
Terada, Hiroshi; and Shirayama, Kenzo, 3,700,753.
Yamagishi, Akio; Kondo, Hisashi; Matsumoto, Genya; and Kondo, Shigekatsu, 3,700,718.

Sumiyoshi, Masharu: *See*—
Shirai, Takeaki; Sakakibara, Shigeru; Noguchi, Masaaki; and Sumiyoshi, Masharu, 3,700,079.

Summers, Daniel J., Jr.: *See*—
Lowery, Ronald M.; and Summers, Daniel J., Jr., 3,700,808.

Sun Shipbuilding & Dry Dock Company: *See*—
Cantagallo, Raymond E.; and Lutz, Robert J., 3,699,870.

Sunano, Naomasa: *See*—
Sumi, Kiyoshi; and Sunano, Naomasa, 3,699,803.

Sunbeam Corporation: *See*—
Waters, Robert S.; and Spohr, Albert S., 3,699,952.

Sundby, Bjorn; Kenney, Edward J.; and Wixon, Harold E., to Colgate-Palmolive Company. Detergent compositions containing N-oxide-aminocarboxylates. 3,700,607, Cl. 252-527.000.

Surak, John G.: *See*—
Isaac, George L.; Kingsbury, Richard F.; and Surak, John G., 3,701,021.

Surprise, Jon M.: *See*—
Apicella, Anthony M., Jr.; and Surprise, Jon M., 3,701,124.

Susquehanna Corporation, The: *See*—
Kreuzer, John A.; and Thompson, David E., 3,699,891.

Sutherland, David C.: *See*—
Anderson, Howard H.; Moyer, Rudolph H.; Sibbert, Donald, J.; and Sutherland, David C., 3,700,896.

Sutton, Denver. Tandem wheeled vehicle with stabilizing apparatus. 3,700,059, Cl. 180-30.000.

Suzuki, Koji, to Iwasaki Tsushinki Kabushiki Kaisha a/k/a Iwatsu Electric Co., Ltd. Count-down circuit using a tunnel diode. 3,700,917, Cl. 307-225.00b.

Suzuki, Saburo; Isono, Kiyoshi; Nagatsu, Junsaku; Akashiba, Takeo; and Sasaki, Shigeki. Antibiotics of agricultural fungicides, polyoxins A and B; and process for preparing. 3,700,655, Cl. 260-211.500.

Suzuki, Yoshiji; Hayashi, Ikuo; Karasawa, Kazuo; and Shimada, Mitsuhiro, to Hamamatsu TV Company, Limited. Image dissector tube. 3,700,953, Cl. 315-11.000.

Svenska Dataregister AB: *See*—
Englund, Gosta Roland; Eriksson, Bjorn Sven Hilding; Mattsson, Mats Erik; and Lindelow, Claes-Goran, 3,700,863.

Swain, Charles Gardner, to Ionics, Incorporated. Temperature-compensated current reference. 3,700,934, Cl. 307-310.000.

Swanson, William C.; Moyer, Donald W.; and Asmus, Rodger W., to International Harvester Company. Manual disconnect and feathering control for a hydrostatic transmission. 3,699,678, Cl. 60-53.00r.

Sweeney, David F.: *See*—
Ahrns, Wilbur C.; Sweeney, David F.; and Dannatt, Hugh St., 3,700,087.

Sweeney, Richard F.: *See*—
Anello, Louis G.; and Sweeney, Richard F., 3,700,646.

Sweeney, Richard Francis; and Yao, Charles Cheng-Yu, to Allied Chemical Corporation. Preparation of polyhaloisoalkoxyalkanoic acids and derivatives thereof. 3,700,733, Cl. 260-544.00f.

Sweeny, Allen N., to Devlieg Machine Company. Tool having resilient bumper. 3,699,843, Cl. 90-11.00a.

Swett, James B.; and Ashton, Harold P., to Dart Industries, Inc. Mold for ingestible substances. 3,700,204, Cl. 249-104.000.

Switchenbank, Colin; and Viste, Kenneth L., to Rohm and Haas Company. N-(1,1-dimethyl-2-but-n-1)3,5-dichlorobanzamide. 3,700,732, Cl. 260-558.00d.

Sylvania Electric Products Inc.: *See*—
Brown, Stephen V., 3,700,377.
Cocca, Frank J., 3,699,644.
Jayne, Max L.; and Williams, Charles A., 3,701,081.
Miller, John J.; and Rychlewski, Thaddeus V., 3,700,444.
Mrugala, Joseph V., 3,700,226.

Symmes, David T.: *See*—
Chace, Donald E.; Melvin, James A., Jr.; Ricketts, Alan W., Jr.; Steinberger, Edward P.; and Symmes, David T., 3,701,113.

Symoniak, Martin Francis; Torke, David Allen; and Holmes, Ervine Stout, to Union Carbide Corporation. Isoparaffin-n-paraffin separation process. 3,700,589, Cl. 208-310.000.

Szpur, Roman, to Sebon Corporation, The. Syringe and method. 3,699,961, Cl. 128-218.00m.

Szucs, Laszlo G. Antimicrobial woven or knitted fabric. 3,699,958, Cl. 128-146.200.

Tadema, Harco J.: *See*—
Bezemer, Cornelis; Tadema, Harco J.; and Houbolt, Jacob J.H.C., 3,700,593.

Tago, Satoshi, to Mitsubushi Petrochemical Co., Ltd. Process for the production of synthetic resin pipes. 3,700,764, Cl. 264-273.000.

Tajchman, Edwin J.: *See*—
Harrison, Lee, III; Honey, Francis J.; and Tajchman, Edwin J., 3,700,792.

Takacs, Edward Andrew, to American Cyanamid Company. Isomerization of alpha-pinene. 3,700,746, Cl. 260-675.500.

Takacs, Edward Andrew, to American Cyanamid Company. Isomerization of terpenes. 3,700,747, Cl. 260-675.500.

Takada, Syun: *See*—
Ishikawa, Hidehiko; Sato, Mikio; and Takada, Syun, 3,700,455.

Takahashi, Satoshi: *See*—
Fukuoka, Ichiro; Takahashi, Satoshi; and Yagi, Norio, 3,700,645.

Takahashi, Senji, to Japan Aircraft Manufacturing Company Limited. Device for monitoring a fluid pressure system. 3,699,810, Cl. 73-168.000.

Takakuwa, Yasuo: *See*—
Kokubo, Ryo; Takakuwa, Yasuo; Shiroishi, Akihiro; and Kihara, Mitsuji, 3,700,672.

Takayama, Kenichiro: *See*—
Abe, Shigeo; and Takayama, Kenichiro, 3,700,556.

Takeda, Yukio, to Matsushita Electric Industrial Co., Ltd. Reproducing device. 3,699,670, Cl. 35-35.00c.

Takeno, Syozo: *See*—
Yasuda, Nobuaki; Ogawa, Takenobu; Murakami, Yoshio; Higashinakagawa, Iwao; Takeno, Syozo; and Tanaka, Norio, 3,699,619.

Takigawa, Katunobu: *See*—
Ota, Tomiyoshi; Takigawa, Katunobu; and Honda, Masasada, 3,699,948.

Talalay, Anselm: *See*—
Spicer, Alvin W.; and Talalay, Anselm, 3,700,365.

Talgo, Paul, to Fuller Company. Klin seal. 3,700,220, Cl. 263-32.00r.

Tamada, Sieechi: *See*—
Haga, Ichiro; and Tamada, Sieechi, 3,701,146.

Tamol, Ronald A.; and Meyer, Leo F., to Morris, Philip, Incorporation. Film covering for apertured smoking product wrapper. 3,699,973, Cl. 131-15.00b.

Tanaka, Haruo: *See*—
Nakayama, Kiyoshi; Tanaka, Haruo; and Hagino, Hiroshi, 3,700,557.

Tanaka, Motoaki: *See*—
Sakamoto, Kenro; Tanaka, Motoaki; Hanzawa, Teruo; and Kasai, Keiji, 3,700,454.

Tanaka, Norio: *See*—
Yasuda, Nobuaki; Ogawa, Takenobu; Murakami, Yoshio; Higashinakagawa, Iwao; Takeno, Syozo; and Tanaka, Norio, 3,699,619.

Tanaka, Osamu; and Matsumoto, Fumio, to Nippon Steel Corporation. Method for reducing an iron loss of an oriented magnetic steel sheet having a high magnetic inductor. 3,700,506, Cl. 148-111.000.

Tanimoto, Fumio: *See*—
Kitano, Hisao; and Tanimoto, Fumio, 3,700,667.

Taplin, Stanley Donovan; and Pettitt, Malcolm Jack, to International Computer Limited. Circuit interconnecting cables and methods of making such cables. 3,700,825, Cl. 174-36.000.

Tappan Company, The, mesne: *See*—
Granieri, George John; and Lefkowitz, Edward Herbert, 3,700,914.

Tarassoff, Peter: *See*—
Themelis, Nickolas J.; and Tarassoff, Peter, 3,700,431.

Tarassov, Victor John: *See*—
Lumley, Robert Miller; and Tarassov, Victor John, 3,700,850.

Tarbox, John W.; Hinds, Walter E.; and Castro, Rodolfo, to Hughes Aircraft Company. System for ordered dispensing of wire and the like. 3,699,630, Cl. 29-203.0mw.

Tarm, Paul B.: *See*—
Johnson, James L.; Schora, Frank C., Jr.; and Tarm, Paul B., 3,700,421.

Tarman, Paul B.: *See*—
Johnson, James L.; Schora, Frank C., Jr.; and Tarman, Paul B., 3,700,422.

Tata, Raymond V.: *See*—
Brouwer, Charles W.; Bucheister, Henry C.; and Tata, Raymond V., 3,700,051.

Tatematsu, Kenzo; Hosono, Hiroo; Katagiri, Toshio; Hayashi, Yoshiaki; and Ando, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Automatic answering telephone set. 3,700,818, Cl. 179-6.00r.

Tauber, Elisha, to Commonwealth Scientific and Industrial Research Organization. Acid resistant basalt-clay product and slip casting process. 3,700,472, Cl. 106-39.00r.

Tautz, William Paul: *See*—

Beaman, Alden Gamaliel; Duschinsky, Robert; and Tautz, William Paul, 3,700,698.
Taylor, Fredrick J., to Texas Instruments, Incorporated. Synthesized cascaded processor system. 3,700,866, Cl. 235-150.100.
Taylor, Larry Christopher, to Pennwalt Corporation. Refrigerant recovery system. 3,699,781, Cl. 62-474.000.
Taylor, Robert W.; and Sellers, Jerry W., to Rockwell Manufacturing Company. Power driven hand tool. 3,699,655, Cl. 30-216.000.
Technicon Instruments Corporation: *See—*
Widmark, Rudolph M.; Lichtenstein, Bernard; Paseltiner, Lynn; and Padawer, Jacques, 3,700,555.
Technomatic AG: *See—*
Herion, Erich; and Ruchser, Erich, 3,699,993.
Tecna Corporation: *See—*
Kitrilakis, Sotiris; and Robinson, Thomas C., 3,699,956.
Kitrilakis, Sotiris, 3,700,380.
Robinson, Thomas C., 3,699,957.
Teijin Limited: *See—*
Shimauchi, Shiro; Kitamura, Yuko; Iwabuchi, Osamu; and Matsui, Takeshi, 3,700,399.
Tel-E-Lect, Inc.: *See—*
Kennedy, Ray L., 3,699,851.
Telesco Brophey Limited: *See—*
Weber, Heinz, 3,699,988.
Templin, Jackson R.: *See—*
Beehler, Larry A.; and Templin, Jackson R., 3,700,165.
Tenneco Chemicals, Inc.: *See—*
Fath, Joseph; and Rosen, Marvin, 3,700,612.
Tenner, Oskar, to Gravicast Patentverwertungsgesellschaft m.b.H. Method of casting turet melts. 3,700,025, Cl. 164-120.000.
Tennes, Charles J.: *See—*
Borrevik, Alexander J.; and Tennes, Charles J., 3,701,040.
Tenney, Frederick H.: *See—*
Kopec, John C.; Schmitt, Henry O., Jr.; and Tenney, Frederick H., 3,699,892.
Tension Structures Co.: *See—*
Huddle, Carl F., 3,699,987.
Terada, Hiroshi; and Shirayama, Kenzo, to Sumitomo Chemical Company, Ltd. Polymer compositions comprising polyethylene and ethylene/propylene copolymer. 3,700,753, Cl. 260-876.00b.
Terasaki, Shingan, to Nikko Pen Kabushiki Kaisha. Multicolor ballpoint pen. 3,700,340, Cl. 401-33.000.
Terasawa, Michitaka, to Tokyo Shibaura Electric Co., Ltd. X-ray tube. 3,700,950, Cl. 313-55.000.
Terenzi, Joseph Francis, to American Cyanamid Company. High impact weatherable rigidefied structures. 3,700,546, Cl. 161-195.000.
Terenzi, Joseph Francis, to American Cyanamid Company. Process for preparation of rubber modified styrene-acrylonitrile polymers. 3,700,622, Cl. 260-33.6ao.
Terkelsen, Bruce E.: *See—*
Giamei, Anthony F.; and Terkelsen, Bruce E., 3,700,023.
Terry, Claude Edward, to Textile Rubber & Chemicals Company. Method of applying a backing to a carpet and product. 3,700,515, Cl. 156-72.000.
Terry, William M.; Graham, John W.; Sinclair, Albert R.; and Kiel, Othar M., to Esso Production Research Company. Method for fracturing subterranean formations. 3,700,032, Cl. 166-283.000.
Terzian, Rouben T.: *See—*
Glass, Marvin I.; and Terzian, Rouben T., 3,699,710.
Tesar, Ian A. Instructional device with interchangeable indicia cards. 3,699,668, Cl. 35-9.00d.
Tesdahl, Thomas C.: *See—*
Coffey, Charles R.; and Tesdahl, Thomas C., 3,700,013.
Teske, Fritz; Teske, Lothar; and Dreismann, Robert. Slide ring for radial and axial sealing. 3,700,248, Cl. 277-80.000.
Teske, Lothar: *See—*
Teske, Fritz; Teske, Lothar; and Dreismann, Robert, 3,700,248.
Tetsuhiro, Kusunose: *See—*
Ishikawa, Tatsuo; Hiruta, Shiro; Wakabayashi, Teruomi; Inamoto, Yoshihiko; Tetsuhiro, Kusunose; Isumaki, Tatsuichi; and Ota, Masami, 3,700,662.
Texas Instruments, Incorporated: *See—*
Belasco, Melvin; and Borrello, Sebastian R., 3,700,980.
Taylor, Fredrick J., 3,700,866.
Textile Rubber & Chemicals Company: *See—*
Terry, Claude Edward, 3,700,515.
Texture-Tex, Incorporated: *See—*
Lunsford, Leslie E.; Simmons, Clyde A.; and Evans, William L., 3,699,664.
Themelis, Nickolas J.; and Tarassoff, Peter, to Noranda Mines Limited. Preparation and method of feeding copper concentrates and method of tapping copper in the continuous smelting and converting process. 3,700,431, Cl. 75-73.000.
Theurer, Josef: *See—*
Plasser, Franz; and Theurer, Josef, 3,699,894.
Thiemann, Josef Ernst; and Pagani, Hermes, to Gruppo Lepetit S.p.A. Production of L-tryptophan by fermentation. 3,700,558, Cl. 195-29.000.
Thierstein, Hans, to Buser, Fritz, AG Maschinenfabrik. Screen printing machine with transport band for temporarily adhesively securing web during printing. 3,699,885, Cl. 101-118.000.
Thomas, James A.: *See—*
Conant, Barton C.; and Thomas, James A., 3,699,981.
Thomas, James L.: *See—*
Denigan, Thomas R.; and Thomas, James L., 3,699,839.
Thomas, McKinley B.: *See—*
Baxter, Calvin J.; and Thomas, McKinley B., 3,700,222.
Thomas, Neal C., to Bendix Corporation, The. Shipping container for fragile articles. 3,700,097, Cl. 206-46.0ft.
Thompson, David E.: *See—*
Kreuzer, John A.; and Thompson, David E., 3,699,891.
Thomson, Kenneth W., to Eastman Kodak Company. Rewind device for web handling apparatus. 3,700,187, Cl. 242-190.000.
Thorn Lighting Limited: *See—*
Clarke, Maurice George; and Burgess, Norman, 3,700,951.
Thornley, Clive E.: *See—*
Petite, Anthony M.; and Thornley, Clive E., 3,700,405.
Thrun, Paul H. Vehicle pollution control unit. 3,700,029, Cl. 165-51.000.
Thurman, Lewis: *See—*
Riley, Ray Joe, 3,700,459.
Timex Corporation: *See—*
Zatsky, Norman Charles, 3,699,762.
Timperman, Eugene L., to General Electric Company. VTOL propulsion system. 3,700,189, Cl. 244-12.000.
Tiraspolsky, Wladimir; Rouviere, Roger; and Wilim, Yves, to Institut Francais du Petrole, des Carburants et Lubrifiants. Device for connecting a drill bit to a drill string provided with a penetrometer. 3,700,049, Cl. 175-50.000.
Titchenal, Oliver R.; and Armstrong, William A., to Basic Packaging Systems, Inc. Apparatus for filling a chain of connected bag elements. 3,699,746, Cl. 53-187.000.
Tjassens, Hindrik: *See—*
Van Iperen, Bernardus Bastiaan; and Tjassens, Hindrik, 3,701,049.
Toba, Takao, to Denki Onkyo Co., Ltd. Voltage-multiplying rectifier apparatus. 3,701,002, Cl. 321-15.000.
Tobias, John D., 4% to O'Hara, John P., Jr. and 4% to O'Hara, Genevieve M. Valve structure and boost control system. 3,700,004, Cl. 137-625.230.
Tofflemire, Benjamin F. Combination closing and opening pliers for reversible matrix band clamp. 3,699,595, Cl. 7-3.000.
Togashi, Tetuo: *See—*
Ishikawa, Teruo; Kawashima, Koji; and Togashi, Tetuo, 3,700,846.
Toko Kabushiki Kaisha: *See—*
Gocho, Yukisato; and Inokuchi, Takahiro, 3,701,030.
Tokura, Susumu: *See—*
Matsui, Masao; Tokura, Susumu; and Yamabe, Masahiro, 3,700,545.
Tokyo Keidenki Kabushiki Kaisha: *See—*
Kunio, Tone, 3,700,965.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Abe, Isao; Hirose, Tatsuo; and Ohshima, Kotaro, 3,699,976.
Ishikawa, Teruo; Kawashima, Koji; and Togashi, Tetuo, 3,700,846.
Kurokawa, Toshio; Nishiyama, Shoji; Nagai, Katsumi; and Mochizuki, Yuu, 3,700,229.
Terasawa, Michitaka, 3,700,950.
Yasuda, Nobuaki; Ogawa, Takenobu; Murakami, Yoshio; Higashinakagawa, Iwao; Takeno, Syozo; and Tanaka, Norio, 3,699,619.
Tokyo Shibaura Electric, Ltd.: *See—*
Shimada, Takashi, 3,700,963.
Tomimura, Noboru: *See—*
Ozawa, Syuichi; and Tomimura, Noboru, 3,701,056.
Tomisawa, Norio, to Nippon Gakki Seizo Kabushiki Kaisha. Vibrato effect producing apparatus using a plurality of reproducing heads which are individually reciprocally displaced relative to each other. 3,700,783, Cl. 84-1.250.
Tomomitsu, Toshio: *See—*
Fujii, Tatsuo; and Tomomitsu, Toshio, 3,700,337.
Toray Industries, Inc.: *See—*
Wakamatsu, Shigeru; Kondo, Ryozo; and Shinomiya, Masayasu, 3,700,669.
Torke, David Allen: *See—*
Symoniak, Martin Francis; Torke, David Allen; and Holmes, Ervine Stout, 3,700,589.
Torrington Company Limited, The: *See—*
Batt, Robert S., 3,700,299.
Toshio Kurokawa, Shoji Nishiyama: *See—*
Kurokawa, Toshio; Nishiyama, Shoji; Nagai, Katsumi; and Mochizuki, Yuu, 3,700,229.
Tournoy, Willy, to N.V. Bekaert S.A. Hot worked steel method and product. 3,699,797, Cl. 72-286.000.
Tourtellotte, John F.; Negra, John S.; Warshaw, Abe; and Villiers-Fisher, John F., to Chemical Construction Corporation. Engine exhaust emission control system. 3,699,683, Cl. 60-274.000.
Town & Country Cleaners Franchises, Inc.: *See—*
Putt, Frank E., 3,699,607.
Toyo Seikan Kabushiki Kaisha: *See—*
Sato, Yoshikatsu, 3,700,524.
Toyomoto, Kazuo: *See—*
Yamaguchi, Koretaka; Toyomoto, Kazuo; and Sakamoto, Kuniaki, 3,700,755.
Toyota Jidosha Hanbai Kabushiki Kaisha: *See—*
Nasu, Jiro; Ogawa, Tokuo; and Sekine, Yoshio, 3,700,084.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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Shirai, Takeaki; Sakakibara, Shigeru; Noguchi, Masaaki; and Sumiyoshi, Masharu, 3,700,079.
Tracy, Charles H. Apparatus for passing a ball through a series of concentric containers. 3,700,241, Cl. 273-95.00r.
Trahn, Kenneth A.: *See*—
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Tregear, Geoffrey W.; Battaerd, Hendrik A. J.; Lang, Gunter A.; Catt, Kevin; and Niall, Hugh D., to Imperial Chemical Industrial. Graft copolymers. 3,700,609, Cl. 260-2.50r.
Treiber, Otis D. Valve operating arrangement for internal combustion reciprocating engines. 3,699,933, Cl. 123-90.270.
Treves, David: *See*—
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Trundle, Albert S., to United States of America, Army. Light scattering cell. 3,700,338, Cl. 356-246.000.
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Elverum, Gerard W., Jr., 3,699,772.
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Tsubakihara, Shuzo, to Denki Onkyo Co., Ltd. Saturable reactor. 3,701,067, Cl. 336-90.000.
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Tsugami, Taishke. Apparatus for producing a punched tape record for recording working conditions of machine tools. 3,701,110, Cl. 340-172.500.
Tuccinardi, Thomas E.; and Miller, Joseph W., Jr., to United States of America, Army. Circuit for generating a repeatable voltage as a function of temperature. 3,701,004, Cl. 323-69.000.
Turbanti, Luigi. Esters of 2-hydroxy-cyclohexane-2-substituted carboxylic acids. 3,700,675, Cl. 260-293.820.
Turbanti, Luigi. Choleretic activity. 3,700,775, Cl. 424-317.000.
Turner, Charles A.; and Siemssen, Ernst A. Method of descaling. 3,699,726, Cl. 51-319.000.
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Tuttle, James W.: *See*—
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Uchiyama, Yasuji, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic tremolo effect producing device. 3,700,782, Cl. 84-1.240.
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Ueda, Masahiro: *See*—
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Ueno, Katsuji; and Oshima, Takao, to Sumitomo Chemical Co., Ltd. Process for preparing alkylene oxide polymer. 3,700,608, Cl. 260-2.00a.
Uhrig, Jerome W., to United States of America, Air Force. Helicopter UHF antenna system for satellite communications. 3,701,157, Cl. 343-708.000.
Uitti, Kenneth D.; and Carson, Don B., to Universal Oil Products Company. Vapor-liquid contacting device. 3,700,216, Cl. 261-114.00r.
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National Aeronautics & Space Administration; Acting Administrator; with respect to an invention of:
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National Aeronautics and: *See*—
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National Aeronautics and Space Administration; Acting Administrator; with respect to an invention of:
Egli, Paul H. Method of forming transparent films of Z_nO. 3,700,575, Cl. 204-192.000.
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Perlman, Marvin. Pseudnoise sequence generators with three-tap linear feedback shift registers. 3,700,869, Cl. 235-152.000.
Wellman, John B. Gas flow control device. 3,700,005, Cl. 137-608.000.
Navy: *See—*
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Vadasz, Leslie L., to Intel Corporation. Integrated circuit structure and method for making integrated circuit structure. 3,699,646, Cl. 29-571.000.
Vagin, Alexei Alexeevich; Yablonsky, Stanislav Valerievich; Voloshin, Petr Stepanovich; Sharov, Nikolai Grigorievich; Shiborin, Viktor Ivanovich; Novakovsky, Vladimir Efimovich; Kolpakov, Grigory Vasilievich; Ivanov, Mark Efremovich; Lindin, Viktor Mikhailvich; and Lipsky, Daniil Yakovlevich, to Dzerzhinsky Filial Nauchno-Issledovatelskogo i Konstruktorskogo Instituta Khimicheskogo Mashinostroenia. Apparatus for granulating melts. 3,700,364, Cl. 18-2.500.
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Van Dievoet, Jean-Paul Laurent, to Societe Belge pour l'Industrie Nucleaire S.A. Method of fabricating a fuel rod having a porous plug. 3,699,638, Cl. 29-458.000.
Van Dongen, Cornelis G., to Bio-Research Consultants, Inc. Combination cage and feeder for rodents. 3,699,925, Cl. 119-18.000.
Van Dongen, Cornelis G., to Bio-Research Consultants, Inc. Feeder for rodents. 3,699,927, Cl. 119-61.000.
Van Haaften, Egbert, to Bulova Watch Company, Inc. Tuning-fork type electronic clock having push-pull indexing mechanism. 3,699,764, Cl. 58-23.0tf.
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Van Huis, Robert L., to U.S. Industries, Inc. Trough coupler with chain guide for chain conveyor type animal feeder. 3,700,093, Cl. 198-204.000.
Van Iperen, Bernardus Bastiaan; and Tjassens, Hindrik, to U. S. Philips Corporation. Microwave oscillator employing a cavity resonator having dielectric walls used as a quarter wave impedance transformer. 3,701,049, Cl. 331-107.00r.
Van Kralingen, Peter H., to Shell Oil Company. Tubular water quench process with water film cooling. 3,700,763, Cl. 264-95.000.
Van Moorselaar, Rudolf; and Van Houtenlaan, Weesp, to U.S. Philips Corporation. Steroids of the androstane series, methods of producing the same, pharamceutial preparations containing said compounds as active ingredients and methods of producing the said peparations. 3,700,703, Cl. 260-397.400.
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Verge, Kenneth W.; Kachman, Robert D.; and Read, Ronald G., to Bendix Corporation, The. Ring gear drive with internal rotary clutch. 3,700,362, Cl. 418-60.000.
Verley, Donald J. Hydraulically powered waste disposal device. 3,700,178, Cl. 241-46.00b.
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Violette, Glenn M.; Paquin, Leon J.; and Lock, James A., to International Paper Company. Method of making a liminate having varying thickness. 3,700,525, Cl. 156-244.000.

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Waaben, Sigurd Gunther; and Weiss, Walter Ira, to Bell Telephone Laboratories, Incorporated. Control circuitry and voltage source for use with charge storage diode. 3,701,119, Cl. 340-173.00r.

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Wagner, William S. Apparatus for forming roller bearing cages. 3,699,793, Cl. 72-134.000.

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Wakamatsu, Shigeru; Kondo, Ryozo; and Shinomiya, Masayasu, to Toray Industries, Inc. Separation and purification process for lactams. 3,700,669, Cl. 260-293.300.

Wald, Milton M.; and Gaum Myron G.; deceased, said Wald assor. to Shell Oil Company. Selectively hydrogenated block copolymers. 3,700,633, Cl. 260-880.00b.

Waldron, Bradley C., to King Nutronics Corporation. Temperature calibration system. 3,699,800, Cl. 73-1.00f.

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Wallace, Howard O. Building component and system. 3,699,736, Cl. 52-436.000.

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Wang, Chien San. Measuring system employing a sensing loop and a reference loop in bucking relationship to provide current-to-voltage conversion. 3,701,014, Cl. 324-98.000.

Wanlass, Bert R., to General Motors Corporation. Closure mounting means. 3,699,716, Cl. 49-40.000.

Wanner, Maurice Paul; and Wallis, Neil Rudolf, to Aerocoat S.A. Spraying booth. 3,700,389, Cl. 55-413.000.

Warner, Walter C.: *See—*
Ford, Bryce W.; Meyer, Daniel A.; and Warner, Walter C., 3,699,808.

Warren, Henry Ray, to RCA Corporation. Web transport apparatus. 3,700,152, Cl. 226-108.000.

Warshaw, Abe: *See—*
Tourtellotte, John F.; Negra, John S.; Warshaw, Abe; and Villiers-Fisher, John F., 3,699,683.

Warwick Electronics, Inc.: *See—*
Padgett, William J.; and Wison, Donald A., 3,701,103.

Wasson, Burton K.; and Williams, Haydn W. R., to Frost, Charles E., & Co. 3,3-Disubstituted-3,4-dihydrobenzodioxepins. 3,700,691, Cl. 260-340.300.

Watanabe, Nobuatsu; and Fukuda, Masataro, to Matsushita Electric Industrial Co., Ltd. High energy density battery. 3,700,502, Cl. 136-6.000.

Watanabe, Takeshi; and Saito, Yuzi, to Nippon Electric Co., Ltd. Color television picture tube. 3,700,949, Cl. 313-85.000.

Watatani, Mitsuo: *See—*
Soma, Nobuo; Watatani, Mitsuo; Nakazawa, Junichi; Sato, Yoshio; Kuwabara, Yoshimi; and Ishikawa, Hidehiko, 3,700,682.

Waters, James R. Floor hoist. 3,700,132, Cl. 214-768.000.

Waters, Robert S.; and Spohr, Albert S., to Sunbeam Corporation. Skin treating appliance. 3,699,952, Cl. 128-24.200.

Watkins, Phillip L.; and Cox, Raymond W., to United States of America, Navy. Shift register clocking at high speeds where parallel operation is needed. 3,700,931, Cl. 328-63.000.

Watson, Donald W: *See—*
Hutner, Mark A.; Polit, Neil A.; Watson, Donald W; and Artelt, Herbert C., Jr., 3,700,324.

Watson, Edward John, Jr., to Morton-Norwich Products, Inc., mesne. 3,4-Dihydrobenzo (B) (1,7) naphthyridin-1(2H)-ones. 3,700,673, Cl. 260-287.00r.

Watson, Roy: *See—*
Cousins, Morison S.; Klawson, Rennold L.; and Watson, Roy, 3,700,146.

Watter, Doris: *See—*
Watter, Michael, 3,699,690.

Watter, Michael; deceased (by Watter, Doris; sole executrix). Method of laying pipeline and means thereof. 3,699,690, Cl. 61-72.100.

Waugh, Richard A., to General Electric Company. Additive dispensing arrangement. 3,699,785, Cl. 68-17.00a.

Way-co, Incorporated: *See—*
Harkenrider, Robert J.; and Moe, John L., 3,700,933.

Weaver, W. R., Company: *See—*
Steck, William F., III, 3,700,339.

Webber, Harold H.; and Riordan, Pauline F., to Brunswick Corporation. Antistatic garment. 3,699,590, Cl. 2-73.000.

Weber, Abraham; and Frossard, Jacques Jean, to Mead Johnson & Company. Dibenzothiazephine ethers. 3,700,663, Cl. 260-243.00b.

Weber, Heinz, to Telesco Brophey Limited. Collapsible umberella. 3,699,988, Cl. 135-20.000.

Weed, Lucretia J., to Polaroid Corporation. Novel photograic products and processes. 3,700,441, Cl. 96-29.00r.

Weichbrodt, Bjorn. Early detection of damage to machine elements in rolling engagement. 3,699,806, Cl. 73-71.400.

Weidner, Herbert: *See—*
Bienert, Klaus; Lang, Winfried; Nordt, Egon; and Weidner, Herbert, 3,700,413.

Weigel, James Edward: *See—*
Smith, Oliver Wendell; Weigel, James Edward; and Trecker, David John, 3,700,643.

Weigele, Manfred: *See—*
Leimgruber, Willy; and Weigele, Manfred, 3,700,679.

Weigle, Wayne L.: *See—*
Milberger, Walter E.; and Weigle, Wayne L., 3,700,928.

Weinstein, Harold, to International Rectifier Corporation. Controlled rectifier having gate electrode which extends across the gate and cathode layers. 3,700,982, Cl. 317-235.000.

Weisang, Joseph Edouard; and Engelhard, Philippe, to Compagnie Francaise de Raffinage. Hydroreforming catalysts and a method for preparing the same. 3,700,588, Cl. 208-139.000.

Weisbord, Leon: *See*—
Bilinski, Donald J.; and Weisbord, Leon, 3,700,289.

Weiss, Gunter: *See*—
Schruff, Horst; Lehmann, Helmut; Siefen, Jakob; Mathner, Hermann; Adams, Willi; and Weiss, Gunter, 3,700,531.

Weiss, Martin Joseph: *See*—
Remers, William Alan; Gibs, Gabriel Joseph; and Weiss, Martin Joseph, 3,700,684.

Weiss, Walter Ira: *See*—
Waaben, Sigurd Gunther; and Weiss, Walter Ira, 3,701,119.

Welding and Steel Fabrication Co., Inc.: *See*—
Piegza, Henry John, 3,700,267.

Welker, Jerry W.: *See*—
Grey, Donald M.; and Welker, Jerry W., 3,700,119.

Wellman, John B.: *See*—
United States of America, National Aeronautics and Space Administration, 3,700,005.

Wells, Howard E. Continuous molding apparatus. 3,700,368, Cl. 425-115.000.

Werner, Will: *See*—
Blaurock, Gunter; Hans, Stender; and Werner, Will, 3,700,271.

Wernig, James H. Switch for sensing displacement. 3,700,841, Cl. 200-61.440.

Wernikoff, Robert E., to Electronic Image Systems Corporation. Facsimile noise deletion and coding system. 3,700,797, Cl. 178-6.000.

Wessels, Johannes Hendrik: *See*—
Sluys, Robert Nestor Joseph; Wessels, Johannes Hendrik; and Van Den Bussche, Willem, 3,700,798.

Westberg, Bengt Karl-Axel; Odman, Tor Axel; and Fahlstrom, Rune, to Sahlstrom AB. Washing means for a sandwich spreading machine. 3,699,878, Cl. 99-450.400.

Westendorf, Walter J. Grab fork attachment for a loader bucket. 3,700,131, Cl. 214-767.000.

Western Electric Company, Incorporated: *See*—
Bohannon, William D., Jr., 3,700,100.
Cranston, Benjamin H.; and Eleftherion, Michael P., 3,699,640.
Cushman, Robert Holbrook, 3,700,009.
Lumley, Robert Miller; and Tarassov, Victor John, 3,700,850.

Westinghouse Electric Corporation: *See*—
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Milberger, Walter E.; and Weigle, Wayne L., 3,700,928.
Nelkin, Arthur; and Whittaker, Robert H., 3,699,693.
Ortolano, Ralph J., 3,700,353.
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Westland Aircraft Limited: *See*—
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Wheelus, Charles Glenn, to Arizona Chemical Company, mesne. Acetic anhydride modified disproportionated resin. 3,700,634, Cl. 260-97.500.

White, Edward Bailey: *See*—
Whitney, Ian; White, Edward Bailey; and Rowland, Michael Roger, 3,700,511.

White, Gerard, to Bell Telephone Laboratories, Inc. Broadband amplifier having improved gain characteristics. 3,701,033, Cl. 330-21.000.

White, Peter G., to TRW Inc. Spectrometer with rotary scanning disc and method of spectroscopic analysis. 3,700,331, Cl. 356-83.000.

Whitehouse, Harper John, to United States of America, Navy. Surface wave devices for signal processing. 3,701,147, Cl. 340-347.0da.

Whiteson, Bennett V.: *See*—
Anderson, Raymond H., Jr.; and Whiteson, Bennett V., 3,699,798.

Whiting, Robin Joseph: *See*—
Gwillim, David Thomas; and Whiting, Robin Joseph, 3,700,154.

Whitley, James O., Jr.: *See*—
Scales, Ralph E.; and Whitley, James O., Jr., 3,700,014.

Whitney, Ian; White, Edward Bailey; and Rowland, Michael Roger, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defense in Her Britannic Majesty's Government of the. Method of producing tapes of longitudinally aligned carbonfibres. 3,700,511, Cl. 156-60.000.

Whittaker Corporation: *See*—
Chabot, Ronald W.; Leonard, George S.; and Sheena, David, 3,699,856.
Walker, Gerard F., 3,699,636.

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Wicker, Alain: *See*—
Bonnier, Etienne; Allibert, Colette; Driole, Jean; and Wicker, Alain, 3,700,428.

Wicks, Harry O., III, to Acme Highway Products Corporation. Composite expansion joint. 3,699,853, Cl. 94-18.000.

Widmark, Rudolph M.; Lichtenstein, Bernard; Paseltiner, Lynn; and Padawer, Jacques, to Technicon Instruments Corporation. Method and apparatus for lymphocyte separation from blood. 3,700,555, Cl. 195-1.800.

Wiebe, Donald B. Trash container compactor. 3,699,883, Cl. 100-227.000.

Wiechert, Rudolf: *See*—
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Wiegert, Albert Carl; and Schoonmaker, Edward Balmor, to Eastman Kodak Company. Sheet stacking apparatus. 3,700,232, Cl. 271-75.000.

Wieske, Reinhold: *See*—
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Wilcox, Stanley W.: *See*—
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Wild, Anthony Musgrave: *See*—
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Wild Heerbrugg AG, Firma: *See*—
Bertele, Ludwig, 3,700,312.

Wild, Jost: *See*—
Kappeler, Heinrich; and Wild, Jost, 3,700,717.

Wildenberg, Henry N.: *See*—
Janssen, Gail E.; and Wildenberg, Henry N., 3,699,732.

Wildhaber, Ernest. Indexing drive. 3,699,822, Cl. 74-437.000.

Wildhaber, Ernest. Optical scanner with straight scanning line. 3,700,911, Cl. 250-236.000.

Wilhelmsburger Maschinenfabrik, Firma: *See*—
Pahlow, Lothar, 3,700,195.

Wilkens, Hans J.: *See*—
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Williamitis, Victor A., to General Motors Corporation. Method for making the enclosure walls of a low temperature self-cleaning cooking device. 3,700,484, Cl. 117-70.00a.

Williams, Charles A.: *See*—
Jayne, Max L.; and Williams, Charles A., 3,701,081.

Williams, Haydn W. R.: *See*—
Wasson, Burton K.; and Williams, Haydn W. R., 3,700,691.

Williams, John Garland, to RCA Corporation. Computer with probability means to transfer pages from large memory to fast memory. 3,701,107, Cl. 340-172.500.

Williams, Raymond J.: *See*—
Smith, Gerald C.; and Williams, Raymond J., 3,699,832.

Williams, Robert H. Rotary engine. 3,700,357, Cl. 418-239.000.

Williamson, Edward E.: *See*—
Hanley, Harold G.; and Williamson, Edward E., 3,699,612.

Williamson, Thomas B.: *See*—
Brokke, Mervin E.; and Williamson, Thomas B., 3,700,668.

Willm, Yves: *See*—
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Willsey, Charles H., to Seymour Foods, Inc. Carton closing apparatus. 3,699,744, Cl. 53-131.000.

Wilson, Arthur K. Lighting structure. 3,700,877, Cl. 240-3.000.

Wilson, Donald C., to FMC Corporation. Apparatus for preserving delicate food products. 3,699,875, Cl. 99-249.000.

Wilson, Joe C., Jr.: *See*—
Parkin, William J.; and Wilson, Joe C., Jr., 3,700,905.

Wilson, John R.; and Niemoller, Arthur B., to Westinghouse Electric Corporation. Isolating switch. 3,700,840, Cl. 200-48.00r.

Wilson, Thomas B., Jr. Bulk cargo safety barrier apparatus. 3,699,912, Cl. 114-74.00r.

Wiltron Company: *See*—
Stefenel, Rudy S., 3,701,036.

Winkler, Alfred, to Agfa-Gevaert Aktiengesellschaft. Photographic apparatus with impeller-operated source of artificial light. 3,699,860, Cl. 95-11.50r.

Winkler, De Loss E., to Shell Oil Company. Selectively hydrogenated block copolymers. 3,700,748, Cl. 260-879.000.

Winn, George: *See*—
Johnson, Richard Bruce; and Winn, George, 3,699,714.

Winterbottom, Bruce: *See*—
Garvey, Francis J.; and Winterbottom, Bruce, 3,699,729.

Wiseman, Neil L., to Singer Company, The. Address synchronizer. 3,701,104, Cl. 340-172.500.

Wison, Donald A.: *See*—
Padgett, William J.; and Wison, Donald A., 3,701,103.

Witt, Harry S.: *See*—
Chin, James; Witt, Harry S.; and Schwartz, Eli, 3,700,481.

Wittke, Paul, to Condux-Werk Herbert A. Merges KG. Comminutor. 3,700,106, Cl. 210-174.000.

Witzel, Bruce E.: *See*—
Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L., 3,700,773.

Wixon, Harold E.: *See*—
Sundby, Bjorn; Kenney, Edward J.; and Wixon, Harold E., 3,700,607.

Wize, Gary A., to General Motors Corporation. Vehicle passive occupant restraining belt arrangement. 3,700,258, Cl. 280-150.0ab.

Wloszek, Joseph T., to Custom Machine, Inc. Apparatus for supporting and rotating a circular workpiece. 3,699,723, Cl. 51-236.000.

Wolbarst, John, to Polaroid Corporation. Distance establishing arrangement for photographic camera. 3,699,867, Cl. 95-44.000.

Wolff, Gerald, to Identicon Corporation. Decoding bar patterns. 3,701,097, Cl. 340-146.30z.

Wolff, Hans H., to United States of America, Navy. Radar landmass simulator. 3,699,669, Cl. 35-10.40.

Wolfson, Alan B.: *See*—
Lawrence, Benjamin; Wolfson, Alan B.; and Patel, Jayantilal M., 3,700,465.
Patel, Jayantilal M.; Wolfson, Alan B.; and Lawrence, Benjamin, 3,700,464.

Wolk, Ronald H.: *See*—
Johanson, Edwin S.; Wolk, Ronald H.; and Johnson, Clarence A., 3,700,584.

Wonderly, Clifford L., to Florida Gas Company. Process of making honeycomb panels. 3,700,522, Cl. 156-197.000.

Wood, Peter, to Westinghouse Electric Corporation. Thyristor tap changer for electrical inductive apparatus. 3,700,925, Cl. 307-252.00q.

Woolley, John Mathers: *See*—
Dodman, David,; Pearson, Kenneth William; and Woolley, John Mathers, 3,700,605.

World Computer Systems Engineering Corporation: *See*—
Yarbrough, Kenneth A., 3,701,100.

Wright, Howard N., Jr.: *See*—
Johnson, Sam H., Jr.; and Wright, Howard N., Jr., 3,700,726.

Wszolek, Walter R.: *See*—
Kehr, Clifton L.; and Wszolek, Walter R., 3,700,574.

Wyman, John E.: *See*—
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Xerox Coroporation: *See*—
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Yablonsky, Stanislav Valerievich: *See*—
Vagin, Alexei Alexeevich; Yablonsky, Stanislav Valerievich; Volosbin, Petr Stepanovich; Sharov, Nikolai Grigorievich; Shiborin, Viktor Ivanovich; Novakovsky, Vladimir Efimovich; Kolpakov, Grigory Vasilievich; Ivanov, Mark Efremovich; Lindin, Viktor Mikhailvich; and Lipsky, Daniil Yakovlevich, 3,700,364.

Yabuuchi, Hiroshi: *See*—
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Yadlowsky, Slawko: *See*—
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Yagi, Norio: *See*—
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Yamabe, Masahiro: *See*—
Matsui, Masao; Tokura, Susumu; and Yamabe, Masahiro, 3,700,545.

Yamagishi, Akio; Kondo, Hisashi; Matsumoto, Genya; and Kondo, Shigekatsu, to Sumitomo Chemical Company, Ltd. Method for continuous production of pure acetone cyanohydrin. 3,700,718, Cl. 260-465.600.

Yamagishi, Hidehisa; Yokoi, Fumitoshi; and Kutino, Tuyoshi. Method of coating steel electrostatically with aluminum powder coated with a higher fatty-acid salt. 3,700,477, Cl. 117-17.000.

Yamaguchi, Koretaka; Toyomoto, Kazuo; and Sakamoto, Kuniaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing rubbery polymers. 3,700,755, Cl. 260-879.000.

Yamaguchi, Yukiya; Fukushima, Kunihiko; Yasuda, Minoru; and Nagata, Shojiro, to Nippon Hoso Kyokai. Visual feature extraction system for characters and patterns. 3,701,095, Cl. 340-146.3ma.

Yamamoto, Hideaki, to Zenga Bronica Kogyo Kabushiki Kaisha. Combined mechanism of shutter and film in a camera. 3,699,863, Cl. 95-31.0ac.

Yamamoto, Michihiro; and Shimago, Kozo, to Sumitomo Chemical Company. Preparation of p-methylsulfonyl-benzaldehyde. 3,700,736, Cl. 260-607.00a.

Yamamoto, Sadao: *See*—
Sato, Wasuke; Hatakeyama, Shigeyuki; Koide, Masashi; Yamamoto, Sadao; and Fujisawa, Mitsumaro, 3,700,523.

Yamamoto, Tsuyoshi: *See*—
Hatayama, Takefumi; Hamano, Yoshihiko; and Yamamoto, Tsuyoshi, 3,700,572.

Yamamura, Yuichi; Kokubu, Tatsuo; Shigezane, Keisuke; and Mizoguchi, Tomishige. L-leucyl-L-leucyl-L-valyl-L-tyrosinol. 3,700,651, Cl. 260-112.500.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Murakami, Masuo; Inukai, Noriyoshi; Koda, Akio; and Nakano, Koji, 3,700,719.

Yamanouchi, Saburo; Yasuno, Kiyoshi; Yamatokohriyama, Kou Sota; and Okumura, Takuzo, to Sumitomo Chemical Company Limited. Stabilized polyphenylene oxide composition. 3,700,750, Cl. 260-874.000.

Yamatokohriyama, Kou Sota: *See*—
Yamanouchi, Saburo; Yasuno, Kiyoshi; Yamatokohriyama, Kou Sota; and Okumura, Takuzo, 3,700,750.

Yao, Charles Cheng-Yu: *See*—
Sweeney, Richard Francis; and Yao, Charles Cheng-Yu, 3,700,733.

Yarbrough, Kenneth A., to World Computer Systems Engineering Corporation. Controlled access security system. 3,701,100, Cl. 340-149.00a.

Yasuda, Minoru: *See*—
Yamaguchi, Yukiya; Fukushima, Kunihiko; Yasuda, Minoru; and Nagata, Shojiro, 3,701,095.

Yasuda, Nobuaki; Ogawa, Takenobu; Murakami, Yoshio; Higashinakagawa, Iwao; Takeno, Syozo; and Tanaka, Norio, to Tokyo Shibaura Electric Co., Ltd. Method for manufacturing a magnetic thin film memory element. 3,699,619, Cl. 29-604.000.

Yasui, Seimei: *See*—
Hirooka, Masaaki; Yasui, Seimei; Mashita, Kentaro; and Kimura, Fumiyuki, 3,700,648.

Yasuno, Kiyoshi: *See*—
Yamanouchi, Saburo; Yasuno, Kiyoshi; Yamatokohriyama, Kou Sota; and Okumura, Takuzo, 3,700,750.

Yeda Research and Development Co., Ltd.: *See*—
Sprinzak, Yair, 3,700,720.
Zabicky-Zissman, Jacobo Zelik; Oren, Ida; and Katchalski, Ephraim, 3,700,610.

Yhap, Ernesto F., to International Business Machines Corporation. Structured computer notation and system architecture utilizing same. 3,700,873, Cl. 235-156.000.

Yokoi, Fumitoshi: *See*—
Yamagishi, Hidehisa; Yokoi, Fumitoshi; and Kutino, Tuyoshi, 3,700,477.

Yost, Edward F., Jr., to Spectral Data Corporation. Multispectral photography. 3,700,438, Cl. 96-2.000.

Young, Howard S.: *See*—
Dietl, Hans K.; and Young, Howard S., 3,700,701.

Young, Robert Leonard: *See*—
Evans, Ross Hugh; Seltzer, Daniel Arron; and Young, Robert Leonard, 3,700,816.

Youngquist, Mary J., to Eastman Kodak Company. Use of Development inhibitor releasing compounds in photohermographic elements. 3,700,457, Cl. 96-114.100.

Youngstrom, Clifford L. Cellophane tape dispenser. 3,700,151, Cl. 225-26.000.

Yount, Reed E.: *See*—
Hoppin, George S., III; Yount, Reed E.; Berry, Thomas F.; and Barker, James F., 3,700,427.

Zabicky-Zissman, Jacobo Zelik; Oren, Ida; and Katchalski, Ephraim, to Yeda Research and Development Co., Ltd. Copolymers of vinylpyridines with 1,3,5-triacryloylhexahydro-1,3,5-triazine. 3,700,610, Cl. 260-2.10e.

Zacaroli, Edward C., to Hamilton Digital Controls, Inc. Magnetic head assembly with low read to write crosstalk. 3,700,828, Cl. 179-100.20c.

Zaffaroni, Alejandro, to ALZA Corporation. Device for suppressing fertility. 3,699,951, Cl. 128-130.000.

Zaffaroni, Alejandro, to ALZA Corporation. Therapeutic adhesive patch. 3,699,963, Cl. 128-268.000.

Zall, David M., to United States of America, Navy. Spot test for identification of oil contaminants in water. 3,700,409, Cl. 23-230.00r.

Zambone, Albert S., to Pennwalt Corporation. Triglyceride refining. 3,700,704, Cl. 260-425.000.

Zambone, Albert S., to Pennwalt Corporation. Method of refining triglycerides. 3,700,705, Cl. 260-425.000.

Zatsky, Norman Charles, to Timex Corporation. Synchronized contact watch. 3,699,762, Cl. 58-23.0ac.

Zawadzki, Raymond J., to United States of America, Interior. Hydraulic cell for calibrating a pressure transducer. 3,699,849, Cl. 92-61.000.

Zawadzki, Thomas, to O'Neil, Paul F. Sculpturable molding compositions. 3,700,616, Cl. 260-31.60r.

Zenga Bronica Kogyo Kabushiki Kaisha: *See*—
Yamamoto, Hideaki, 3,699,863.

Zenith Radio Corporation: *See*—
Adler, Robert; and Korpel, Adrianus, 3,700,903.
Markin, Joseph; and Sobel, Alan, 3,700,802.

Zeph, David L., to United States of America, Navy. 24-Hour digital clock. 3,699,763, Cl. 58-23.00r.

Ziegler, George William, Jr., to AMP Incorporated. Coaxial connector mounting means. 3,701,083, Cl. 339-64.00m.

Ziermann, Hermann, to General Medical Corporation, mesne. Fluid mixer. 3,699,990, Cl. 137-81.500.

Ziffer, Jack, to Pabst Brewing Company. Recovery of enzymes. 3,700,561, Cl. 195-66.00r.

Zimmermann, Jean Pierre: *See*—
Gerecke, Max; and Zimmermann, Jean Pierre, 3,700,659.

Zinsco Electrical Products: *See*—
Hoss, Robert J., 3,700,967.

Zito Company, The: *See*—
Zito, Ralph, Jr., 3,700,514.

Zito, Ralph, Jr., to Zito Company, The. Making layered structures. 3,700,514, Cl. 156-280.000.

Zoecon Corporation: *See*—
Siddall, John B., 3,700,694.
Siddall, John B., 3,700,696.

Zuech, Ernest A.: *See*—
Brady, Donnie G.; Zuech, Ernest A.; and Gray, Roy A., 3,700,625.

Zuleeg, Rainer; and Ranon, Uri, to McDonnell Douglas Corporation. Negative resistance light emitting diode device. 3,701,043, Cl. 331-94.500.

Zuzelo, Edward A. Multiple grooving of pavement. 3,700,849, Cl. 299-18.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF OCTOBER, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Baxter Lab. Inc.: *See*—
Hoeltzenbein, Josef. Re. 27,510.
Billeter, Henry R., to Sloan Valve Co. Retainer valve. Re. 27,514, 10–24–72, Cl. 137—599.2.
Bredeson, Dean K. Mechanical screw press. Re. 27,515, 10–24–72, Cl. 100—117.
Dow Chemical Co.: *See*—
Layne, Gilbert S., and Huml. Re. 27,509.
Giletta, Dario: *See*—
Pacciarini, Antonio, and Giletta. Re. 27,513.
Hoeltzenbein, Josef, to Baxter Lab. Inc. Artificial kidney. Re. 27,510, 10–24–72, Cl. 210—321.
Huml, James O: *See*—
Layne, Gilbert S., and Huml. Re. 27,509.
Industrie Pirelli S.p.A.: *See*—
Pacciarini, Antonio, and Giletta. Re. 27,513.
Layne, Gilbert S., and J. O. Huml, to Dow Chemical Co. Separation of aluminum from impure aluminum sources. Re. 27,509, 10–24–72, Cl. 75—68.
Locati, Norman C., to Omark Industries Inc. Impact mowing apparatus and system. Re. 27,511, 10–24–72, Cl. 56—245.
Omark Industries Inc.: *See*—
Locati, Norman C. Re. 27,511.
Onitsuka, Kihachiro, Athletic shoes. Re. 27,512, 10–24–72, Cl. 36—2.5.
Pacciarini, Antonio, and D. Giletta, to Industrie Pirelli S.p.A. Apparatus to print an embossed pattern along the peripheral band of a toroidal article. Re. 27,513, 10–24–72, Cl. 425—39.
Sloan Valve Co.: *See*—
Billeter, Henry R. Re. 27,514.

LIST OF DESIGN PATENTEES

Amerace Esna Corp.: *See*—
Heenan, Sidney A. 224,986.
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF OCTOBER, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name. In accordance with city and telephone directory practice.

LIST OF DESIGN PATENTEES

CLASSIFICATION OF PATENTS

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3,700,543
175 3,700,544
3,700,545
195 3,700,546
213 3,700,547

CLASS 162

17 3,700,548
157C 3,700,549

CLASS 164

60 3,700,023
83 3,700,024
120 3,700,025
256 3,700,026
282 3,700,027

CLASS 165

32 3,700,028
51 3,700,029
145 3,700,030

CLASS 166

261 3,700,035
270 3,700,031
283 3,700,032
312 3,700,034

CLASS 172

105 3,700,036
265 3,700,037
3,700,039
311 3,700,040
316 3,700,041
385 3,700,042
400 3,700,043
625 3,700,038
804 3,700,044

CLASS 173

26 3,700,045
103 3,700,046
124 3,700,047

CLASS 174

36 3,700,825
52S 3,700,788
72A 3,700,786

CLASS 175

6 3,700,048
50 3,700,049
65 3,700,050

CLASS 176

37 3,700,550
40 3,700,551
50 3,700,552
72 3,700,553
86M 3,700,554
224 3,700,503

CLASS 177

59 3,700,051
134 3,700,052
136 3,700,053
184 3,700,054
204 3,700,055
237 3,700,056

CLASS 178

5.4M 3,700,789
3,700,790
5.4R 3,700,787
6 3,700,797
3,700,799
6.6DD 3,700,800
6.6SF 3,700,798
6.8 3,700,791
3,700,792
3,700,793
3,700,801
7.1 3,700,794
7.2 3,700,795
7.3D 3,700,802
3,700,805
7.3R 3,700,796
3,700,803
7.5D 3,700,804
22 3,700,806
30 3,700,807
69A 3,700,808
87 3,700,809

CLASS 179

1SA 3,700,815
1D 3,700,811
1P 3,700,812
2DP 3,700,816
2 3,700,814
2.5R 3,700,817
4 3,700,810
5P 3,700,813
6R 3,700,818
15AQ 3,700,819
15BV 3,700,820
16E 3,700,821
18AH 3,700,822
18B 3,700,823
98 3,700,824
100.2C 3,700,827
3,700,828
100.2Z 3,700,826
100.41K 3,700,829
170NC 3,700,831
3,700,832
175.2R 3,700,830

CLASS 180

1R 3,700,057
21 3,700,058
30 3,700,059
53FE 3,700,060
68R 3,700,061
101 3,700,062
114 3,700,063
119 3,700,064
128 3,700,065

CLASS 181

.5NC 3,700,066
33G 3,700,067
33K 3,700,068
36B 3,700,069

CLASS 182

16 3,700,070
150 3,700,071
155 3,700,072

CLASS 186

1AC 3,700,074

CLASS 188

1C 3,700,076
32 3,700,077
180 3,700,078
346 3,700,075

CLASS 191

12R 3,700,833
12.2R 3,700,834

CLASS 192

.07 3,700,081
4A 3,700,079
3,700,080
50 3,700,082
53F 3,700,083
70.28 3,700,084
141 3,700,085

CLASS 193

35 3,700,073

CLASS 195

1.8 3,700,555
28R 3,700,556
29 3,700,557
3,700,558
3,700,559
49 3,700,560
66R 3,700,561
103.5R 3,700,562

CLASS 197

2 3,700,086
98 3,700,087
120 3,700,088

CLASS 198

1 3,700,089
34 3,700,090
103 3,700,091
192R 3,700,092
204 3,700,093
220BC 3,700,094

CLASS 200

38R 3,700,837
3,700,838
48R 3,700,840
52R 3,700,835
3,700,836
56R 3,700,839
61.44 3,700,841
148R 3,700,848
166C 3,700,842
172A 3,700,843

CLASS 201

1 3,700,563
6 3,700,564

CLASS 203

1 3,700,565
3,700,566

CLASS 204

1T 3,700,568
15 3,700,569
55R 3,700,570
67 3,700,571
73R 3,700,572
159.13 3,700,573
159.14 3,700,574
192 3,700,575
195G 3,700,577
195M 3,700,576
195P 3,700,578
3,700,579
3,700,580
243R 3,700,581
275 3,700,582

CLASS 206

25 3,700,470
42 3,700,095
45.33 3,700,096
46FR 3,700,097
52F 3,700,098
59F 3,700,099
65F 3,700,100

CLASS 208

8 3,700,583
10 3,700,584
89 3,700,586
111 3,700,585
131 3,700,587
139 3,700,588
310 3,700,589

CLASS 209

80 3,700,101
158 3,700,102
169 3,700,103
237 3,700,104
421 3,700,105

CLASS 210

17 3,700,590
23 3,700,591
33 3,700,592
40 3,700,593
174 3,700,106
242 3,700,107
3,700,108
3,700,109
308 3,700,110
321 Re.27,510
322 3,700,111
445 3,700,112

CLASS 211

23 3,700,113
150 3,700,114

CLASS 212

38 3,700,115

CLASS 214

1PB 3,700,116
1H 3,700,117
1R 3,700,118
6B 3,700,119
16B 3,700,120
16.4C 3,700,121
24 3,700,122
40 3,700,128
77P 3,700,123
85 3,700,124
86A 3,700,125
141 3,700,126
152 3,700,127
309 3,700,129
454 3,700,130
767 3,700,131
768 3,700,132

CLASS 215

9 3,700,133

CLASS 217

12 3,700,134

CLASS 219

10.55 3,700,846
3,700,847
56 3,699,756
121LM 3,700,850
137 3,700,851
216 3,700,852
222 3,700,853
243 3,700,854
388 3,700,855
451 3,700,856
543 3,700,857

CLASS 220

25 3,700,135
63R 3,700,136
97E 3,700,137

CLASS 221

51 3,700,138
241 3,700,139

CLASS 222

1 3,700,140
3,700,141
109 3,700,142
148 3,700,143
176 3,700,144
202 3,700,145
465 3,700,146

CLASS 224

2A 3,700,147
4J 3,700,148
5.1 3,700,149

CLASS 225

1 3,700,150
26 3,700,151

CLASS 226

108 3,700,152
114 3,700,153
156 3,700,154

CLASS 228

3 3,700,155
4 3,700,156
5 3,700,157
15 3,700,158

CLASS 229

19 3,700,159
34R 3,700,160
41C 3,700,161

CLASS 235

61.11B 3,700,861
61.11E 3,700,858
3,700,860
61.12M 3,700,862
61.7R 3,700,859
62F 3,700,863
78 3,700,162
91M 3,700,163
92F 3,700,864
95R 3,700,164
150.1 3,700,866
150.53 3,700,865
151.3 3,700,867
152 3,700,868
3,700,869
153 3,700,870
154 3,700,871
155 3,700,872
156 3,700,873
164 3,700,874
175 3,700,875
181 3,700,876

CLASS 236

13 3,700,165
34.5 3,700,166

CLASS 238

349 3,700,167

CLASS 239

3 3,700,168
4 3,700,169
102 3,700,170
127.3 3,700,171
188 3,700,172
405 3,700,173
526 3,700,174

CLASS 240

3 3,700,877
7.1LJ 3,700,878
10R 3,700,879
3,700,880
41.35R 3,700,881
41.36 3,700,882
3,700,883
44.2 3,700,884
78H 3,700,885
147 3,700,887

CLASS 241

27 3,700,176
36 3,700,177
37 3,700,175
46B 3,700,178
230 3,700,182
301 3,700,179

CLASS 242

54A 3,700,180
55.3 3,700,181
107.4 3,700,183
3,700,184
159 3,700,185
189 3,700,186
190 3,700,187
194 3,700,188

CLASS 244

1SA 3,700,190
1SS 3,700,193
12 3,700,189
16 3,700,191
139 3,700,192

CLASS 245

10 3,700,194

CLASS 246

63A 3,700,886
169D 3,700,888
415A 3,700,889

CLASS 248

16 3,700,195
44 3,700,196
71 3,700,197
214 3,700,198
292 3,700,199
312 3,700,200
346 3,700,201
354C 3,700,202
419 3,700,203

CLASS 249

104 3,700,204
142 3,700,205

CLASS 250

41.9S 3,700,892
3,700,893
43.5R 3,700,890
3,700,891
50 3,700,894
65R 3,700,895
71R 3,700,896
83R 3,700,897
83.3H 3,700,898
84 3,700,899
190 3,700,900
201 3,700,901
3,700,902
203R 3,700,905
208 3,700,906
217 3,700,903
218 3,700,904
219DF 3,700,909
219DR 3,700,908
219D 3,700,907

225 3,700,910
236 3,700,911

CLASS 251
84 3,700,206
88 3,700,207
90 3,700,208
282 3,700,209
304 3,700,210
3,700,211

CLASS 252
8.55B 3,700,594
50 3,700,598
62.56 3,700,595
62.9 3,700,596
63.2 3,700,597
99 3,700,599
3,700,600
105 3,700,601
301.1R 3,700,602
408 3,700,603
428 3,700,604
471 3,700,605
518 3,700,606
527 3,700,607

CLASS 254
131 3,700,212

CLASS 256
19 3,700,213

CLASS 259
4 3,700,214
98 3,700,215

CLASS 260
2A 3,700,608
2.1E 3,700,610
2.3 3,700,615
2.5R 3,700,609
3,700,609
17R 3,700,611
17.2S 3,700,630
17.4CL 3,700,613
17.4ST 3,700,612
23H 3,700,614
31.6R 3,700,616
31.6 3,700,624
3,700,957
33.4R 3,700,618
33.6AO 3,700,619
3,700,620
3,700,621
3,700,622
3,700,690
37SB 3,700,623
45.75R 3,700,625
45.8R 3,700,626
45.85 3,700,627
47EN 3,700,628
47P 3,700,629
63R 3,700,647
3,700,648
65 3,700,649
67A 3,700,640
70R 3,700,641
75N 3,700,644
75S 3,700,642
77.5AN 3,700,643
77.5CR 3,700,645
79 3,700,650
80.3N 3,700,635
80.72 3,700,636
83.3 3,700,637
84.1 3,700,638
85.5R 3,700,631
87.5C 3,700,632
88.2C 3,700,639
97.5 3,700,634
112.5 3,700,651
3,700,652
148 3,700,653
211.5R 3,700,654
211.5 3,700,655
239.3A 3,700,656
3,700,669
239.3B 3,700,657
239.3R 3,700,658
239.5 3,700,659
239.55R 3,700,670
239.55 3,700,660
240E 3,700,661
242 3,700,662
243B 3,700,663
247.1 3,700,664
248CS 3,700,665
3,700,666
248NS 3,700,667
248 3,700,67[illegible]
249.7P 3,700,672
251R 3,700,668
267 3,700,679
287R 3,700,673
288R 3,700,674
293.54 3,700,734
293.82 3,700,675
294.8D 3,700,677
294.8G 3,700,676
295E 3,700,678
295.5R 3,700,680
295.5 3,700,682
296AE 3,700,681
306.7 3,700,683
306.8D 3,700,684
309 3,700,685
310R 3,700,686
3,700,687
3,700,688
3,700,689
326C 3,700,617
340.3 3,700,691
340.5 3,700,692
340.6 3,700,693
343.5 3,700,696
343.6 3,700,694
345.8 3,700,695
346.2R 3,700,697
348R 3,700,698
349 3,700,699
371 3,700,700
396R 3,700,701
397.4 3,700,703
397.45 3,700,702
404.5 3,700,844
410.9R 3,700,706
425 3,700,704
3,700,705
429.5 3,700,707
438.1 3,700,709
448A 3,700,710
448.2B 3,700,714
448.2E 3,700,712
448.2N 3,700,713
3,700,716
448.8R 3,700,711
3,700,715
453AL 3,700,708
465.2 3,700,717
465.6 3,700,718
470 3,700,721
471R 3,700,719
473A 3,700,720
475R 3,700,725
476R 3,700,727
486H 3,700,723
486R 3,700,722
491 3,700,724
3,700,726
507R 3,700,728
515A 3,700,730
515R 3,700,729
524R 3,700,731
544F 3,700,733
558D 3,700,732
597R 3,700,735
607A 3,700,736
3,700,737
608 3,700,646
613R 3,700,738
3,700,739
631.5 3,700,740
666A 3,700,741
667R 3,700,742
668A 3,700,744
668R 3,700,743
672R 3,700,745
675.5 3,700,746
3,700,747
683.3R 3,700,749
857L 3,700,751
859R 3,700,752
874 3,700,750
876B 3,700,753
878R 3,700,754
879 3,700,748
3,700,755
880B 3,700,633
881 3,700,756
894 3,700,757
897A 3,700,759
897R 3,700,758
950 3,700,760

CLASS 261
114R 3,700,216

CLASS 263
6C 3,700,217
6E 3,700,218
15R 3,700,219
32R 3,700,220

CLASS 264
1 3,700,761
3 3,700,762
95 3,700,763
273 3,700,764
328 3,700,765

CLASS 266
9 3,700,221
23NN 3,700,223
23K 3,700,222
33 3,700,224

CLASS 267
35 3,700,225

CLASS 269
22 3,700,226
24 3,700,227
61 3,700,228
328 3,700,229

CLASS 270
61R 3,700,230

CLASS 271
64 3,700,231
75 3,700,232

CLASS 272
79A 3,700,233

CLASS 273
1M 3,700,234
9 3,700,235
54C 3,700,236
55A 3,700,237
55R 3,700,238
65R 3,700,239
95R 3,700,240
3,700,241
131KP 3,700,242
178R 3,700,243
183D 3,700,244
189A 3,700,245

CLASS 277
3 3,700,246
28 3,700,247
80 3,700,248

CLASS 279
2 3,700,249
35 3,700,250

CLASS 280
7.11 3,700,251
11.13N 3,700,252
11.2 3,700,253
63 3,700,254
81A 3,700,255
87A 3,700,257
87R 3,700,256
150SB 3,700,258
152R 3,700,259
154.5R 3,700,260
406A 3,700,261
3,700,262
415A 3,700,263

CLASS 283
38 3,700,264

CLASS 285
15 3,700,265
24 3,700,266
3,700,267
55 3,700,268
78 3,700,269
337 3,700,270

CLASS 287
52.04 3,700,271

CLASS 289
17 3,700,272

CLASS 293
70 3,700,273

CLASS 294
63R 3,700,274
87.2 3,700,275
3,700,276

CLASS 296
104 3,700,277

CLASS 297
191 3,700,278
232 3,700,279
390 3,700,281
440 3,700,282

CLASS 298
7 3,700,283

CLASS 299
5 3,700,280
18 3,700,849
46 3,700,284
83 3,700,285

CLASS 303
6C 3,700,286

CLASS 305
38 3,700,287
3,700,288

CLASS 307
88.3 3,700,912
107 3,700,913
141 3,700,914
215 3,700,915
3,700,916
225B 3,700,917
230 3,700,918
232 3,700,919
235A 3,700,920
235 3,700,921
246 3,700,922
252B 3,700,923
252Q 3,700,925
255 3,700,924
257 3,700,926
3,700,927
268 3,700,928
291 3,700,929
292 3,700,930
304 3,700,932
310 3,700,933
3,700,934

CLASS 308
2A 3,700,289
3,700,290
3,700,291
3A 3,700,292
9 3,700,293
36.1 3,700,294
72 3,700,295
187.2 3,700,296
3,700,297
194 3,700,298
212 3,700,299
216 3,700,845

CLASS 310
3R 3,700,935
8.1 3,700,936
8.9 3,700,937
9.1 3,700,938
9.8 3,700,939
66 3,700,940
105 3,700,941
164 3,700,942
168 3,700,943
3,700,944

CLASS 312
240 3,700,300
333 3,700,301

CLASS 313
55 3,700,950
84 3,700,945
85S 3,700,948
3,700,949
103 3,700,947
188 3,700,946
346R 3,700,951

CLASS 315
3.5 3,700,952
5.38 3,700,963
11 3,700,953
13C 3,700,954
20 3,700,955
24 3,700,958
29 3,700,959
101 3,700,956
151 3,700,960
169TV 3,700,961
241 3,700,962

CLASS 317
13C 3,700,964
15 3,700,965
18D 3,700,966
3,700,967
31 3,700,968
40R 3,700,969
58 3,700,970
80 3,700,971
137 3,700,972
140 3,700,973
148.5R 3,700,985
230 3,700,974
3,700,975
235R 3,700,976
3,700,977
3,700,978
3,700,979
3,700,980
3,700,981
3,700,982
245 3,700,983

CLASS 318
77 3,700,984
227 3,700,986
3,700,987
3,700,988
3,700,989
375 3,700,990
447 3,700,991
568 3,700,992
579 3,700,994
603 3,700,993
628 3,700,995
696 3,700,996

CLASS 320
1 3,700,998
20 3,700,997
26 3,700,999
64 3,701,000

CLASS 321
5 3,701,001
15 3,701,002

CLASS 323
6 3,701,003
69 3,701,004

CLASS 324
.5R 3,701,005
30R 3,701,006
43R 3,701,007
55 3,701,008
61P 3,701,009
71R 3,701,010
72.5 3,701,011
79R 3,701,012
83D 3,701,013
98 3,701,014
158F 3,701,021
174 3,701,015

CLASS 325
16 3,701,016
38B 3,701,017
58 3,701,018
64 3,701,019
121 3,701,020
318 3,701,022
329 3,701,023
364 3,701,024
470 3,701,025

CLASS 328
15 3,701,026
17 3,701,027
63 3,700,931
91 3,701,029
167 3,701,028

CLASS 329
134 3,701,030

CLASS 330
17 3,701,031
18 3,701,032
21 3,701,033
28 3,701,034
31 3,701,035
85 3,701,036
107 3,701,037
124R 3,701,038

CLASS 331
1A 3,701,039
44 3,701,040
65 3,701,041
94.5 3,701,042
3,701,043
3,701,044
3,701,045
3,701,046
3,701,047
3,701,048
107R 3,701,049
3,701,050
107T 3,701,051
116M 3,701,052

CLASS 332
9T 3,701,053

CLASS 333
1.1 3,701,054
7 3,701,055
8 3,701,056
10 3,701,057
31A 3,701,058
70A 3,701,059
95A 3,701,060
98P 3,701,061

CLASS 335
135 3,701,062
146 3,701,063
205 3,701,064
212 3,701,065
274 3,701,066

CLASS 336
90 3,701,067

CLASS 337
102 3,701,068
160 3,701,069

CLASS 338
162 3,701,070

CLASS 339
4 3,701,071
5L 3,701,072
5P 3,701,073
14R 3,701,074
17CF 3,701,075
3,701,077
17C 3,701,076
19 3,701,078
36 3,701,079
48 3,701,080
53 3,701,081
61M 3,701,082
64M 3,701,083
66M 3,701,084
92M 3,701,085
177R 3,701,086
198G 3,701,087

CLASS 340
2 3,701,088
3R 3,701,089
3,701,090
3.5 3,700,303
15.5AF 3,701,091
27AT 3,701,092
52H 3,701,093
146.1AL 3,701,094
146.1D 3,701,096
146.3AG 3,701,099
146.3MA 3,701,095
146.3H 3,701,098
146.3Z 3,701,097
149A 3,701,100
163 3,701,101
168R 3,701,102
170 3,701,103
172.5 3,701,104
3,701,105
3,701,106
3,701,107
3,701,108
3,701,109
3,701,110
3,701,111
3,701,112
3,701,113
173CR 3,701,115
173LS 3,701,118
3,701,123
173SP 3,701,114
173R 3,701,116
3,701,117
3,701,119
3,701,120
173.2 3,701,121
3,701,122
174HA 3,701,126
174RC 3,701,124
174TF 3,701,125
3,701,127
3,701,128
3,701,129
3,701,132
174YC 3,701,131
174.1E 3,701,135
174.1G 3,701,134
174.1J 3,701,130
174.1M 3,701,133
199 3,701,136
228R 3,701,137
244R 3,701,138
271 3,701,139
283 3,701,140
287 3,701,141
347AD 3,701,144
3,701,148
347DA 3,701,147
347DD 3,701,143
347NT 3,701,142
3,701,145
3,701,146

CLASS 343
5DP 3,701,149
6.5SS 3,701,150
9 3,701,151
16M 3,701,152
17.7 3,701,153
18E 3,701,154
117A 3,701,156
117R 3,701,155
708 3,701,157
725 3,701,158
745 3,701,159
755 3,701,160
770 3,701,161
771 3,701,162
786 3,701,163

CLASS 350
3.5 3,700,302
6 3,700,304
105 3,700,305
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CLASS 352
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91 3,700,317
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CLASS 353
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CLASS 355
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CLASS 356
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83	3,700,331	1	3,700,341	199	3,700,353	270	3,700,363	244	3,700,774	140	3,700,370
97	3,700,332	17	3,700,342	219	3,700,354	CLASS 423		317	3,700,775	144	3,700,371
103	3,700,333	81	3,700,343	CLASS 417		24	3,700,767	322	3,700,776	159	3,700,372
106	3,700,334	108	3,700,344	33	3,700,355	119	3,700,766	323	3,700,777	195	3,700,373
201	3,700,335	150	3,700,345	222	3,700,356	CLASS 424		324	3,700,778	208	3,700,374
226	3,700,336	153	3,700,346	354	3,700,358	118	3,700,768	CLASS 425		422	3,700,375
227	3,700,337	236	3,700,347	404	3,700,359	119	3,700,769	7	3,700,364	CLASS 431	
246	3,700,338	CLASS 416			3,700,360	177	3,700,770	28	3,700,365	13	3,700,376
247	3,700,339	90	3,700,348	477	3,700,361	200	3,700,771	39	Re.27,513	93	3,700,377
CLASS 401		111	3,700,349	CLASS 418		216	3,700,772	71	3,700,366	253	3,700,378
33	3,700,340	114	3,700,350	60	3,700,362	230	3,700,773	112	3,700,367	CLASS 444	
CLASS 408		123	3,700,351	239	3,700,357			115	3,700,368	1	3,700,379
		134	3,700,352					139	3,700,369		

CLASSIFICATION OF DESIGNS

D 4—	4 224,949		248 224,957		224,963	D26—	13 224,972	D41—	1 224,978		224,985
D 6—	50 224,950		224,959		256 224,964		14 224,973		224,979	D72—	224,986
	63 224,951		263 224,958	D14—	6 224,966		15 224,971		224,980	D83—	224,987
	75 224,952	D 9—	182 224,961		224,967	D34—	5 224,976	D45—	4 224,981		12 224,988
	88 224,953		219 224,965		224,968		15 224,974	D61—	1 224,982	D86—	10 224,989
	192 224,954		252 224,960		224,969		224,975	D71—	224,983	D88—	3 224,990
	197 224,955		255 224,962	D24—	1 224,970		224,977		224,984	D90—	1 224,991
D 8—	171 224,956										

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1	:	3,699,609		3,699,738		3,700,233		3,700,771	8	: 3,699,701	10	: 3,699,589
		3,699,930		3,699,741		3,700,235		3,700,784		3,699,786		3,700,398
		3,699,996		3,699,752		3,700,243		3,700,785		3,699,829		3,700,689
		3,700,238		3,699,772		3,700,272		3,700,799		3,699,967		3,700,693
		3,700,251		3,699,775		3,700,280		3,700,801		3,700,150		3,700,727
		3,700,538		3,699,787		3,700,291		3,700,812		3,700,460		3,700,739
		3,700,571		3,699,788		3,700,301		3,700,855		3,700,788		3,700,966
		3,700,708		3,699,795		3,700,310		3,700,869		3,700,792	11	: 3,699,799
		3,701,048		3,699,798		3,700,313		3,700,885		3,700,821		3,700,393
		3,701,058		3,699,800		3,700,314		3,700,887		3,700,822		3,700,575
4	:	3,699,924		3,699,814		3,700,318		3,700,896		3,700,926		3,700,945
		3,699,931		3,699,825		3,700,331		3,700,900		3,700,927	12	: 3,699,628
		3,699,984		3,699,838		3,700,338		3,700,907		3,700,955		3,699,669
		3,700,053		3,699,839		3,700,341		3,700,910		3,701,014		3,699,691
		3,700,102		3,699,847		3,700,344		3,700,913		3,701,057		3,699,721
		3,700,534		3,699,875		3,700,353		3,700,915	9	: Re.27,512		3,699,722
		3,700,870		3,699,883		3,700,380		3,700,931		3,699,623		3,699,761
		3,700,921		3,699,891		3,700,381		3,700,935		3,699,660		3,699,826
		3,700,929		3,699,893		3,700,385		3,700,939		3,699,668		3,699,907
		3,700,977		3,699,912		3,700,386		3,700,964		3,699,719		3,699,915
		3,701,018		3,699,916		3,700,406		3,700,971		3,699,771		3,699,955
		3,701,031		3,699,922		3,700,443		3,700,974		3,699,777		3,700,017
		3,701,055		3,699,933		3,700,445		3,700,976		3,699,981		3,700,072
		3,701,094		3,699,934		3,700,446		3,700,982		3,699,985		3,700,149
		3,701,138		3,699,949		3,700,480		3,700,985		3,699,990		3,700,231
		3,701,158		3,699,951		3,700,498		3,700,997		3,700,023		3,700,302
5	:	3,699,596		3,699,954		3,700,503		3,701,021		3,700,096		3,700,522
		3,699,661		3,699,956		3,700,510		3,701,036		3,700,163		3,700,619
		3,701,025		3,699,957		3,700,527		3,701,039		3,700,166		3,700,620
6	:	3,699,595		3,699,963		3,700,529		3,701,042		3,700,307		3,700,621
		3,699,599		3,699,997		3,700,533		3,701,043		3,700,309		3,700,634
		3,699,600		3,700,005		3,700,550		3,701,046		3,700,354		3,700,690
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		3,699,632		3,700,034		3,700,590		3,701,073		3,700,486		3,701,054
		3,699,646		3,700,054		3,700,591		3,701,079		3,700,487		3,701,072
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		3,699,652		3,700,067		3,700,603		3,701,104		3,700,509		3,699,783
		3,699,667		3,700,077		3,700,633		3,701,105		3,700,546		3,700,515
		3,699,676		3,700,107		3,700,649		3,701,117		3,700,622	15	: 3,699,736
		3,699,682		3,700,119		3,700,668		3,701,123		3,700,681	16	: 3,699,938
		3,699,689		3,700,132		3,700,678		3,701,133		3,700,746	17	: Re.27,514
		3,699,698		3,700,137		3,700,694		3,701,136		3,700,747		3,699,603
		3,699,702		3,700,139		3,700,696		3,701,144		3,700,754		3,699,612
		3,699,705		3,700,142		3,700,699		3,701,147		3,700,781		3,699,615
		3,699,707		3,700,178		3,700,723		3,701,152		3,700,858		3,699,625
		3,699,711		3,700,185		3,700,725		3,701,153		3,700,937		3,699,671
		3,699,712		3,700,191		3,700,729		3,701,156		3,700,995		3,699,677
		3,699,713		3,700,208		3,700,748		3,701,161		3,701,011		3,699,678
		3,699,715		3,700,230		3,700,762		3,701,162		3,701,045		3,699,679

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